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FRENCH FORESTS IN THE WAR ZONE

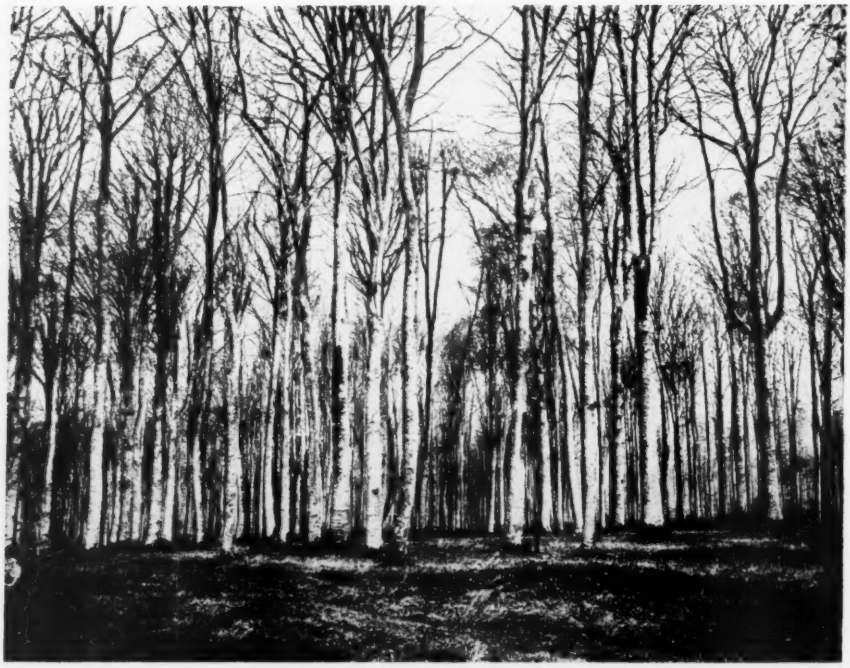
By SAMUEL T. DANA

WHEN the history of the present European war comes to be written, it will probably be found that the forests of the regions involved have played a much more important part than is suspected by the ordinary reader. A hint of this is contained in a German news despatch of October 14, which read, "Heavy fighting continues in the Argonnes. Our troops are moving through dense underwood in very difficult ground with siege trains for use against the fortifications. The French troops offer obstinate resistance, firing from trees where machine guns are posted."

It is stated that this same forest of Argonne, which has been the scene of such vigorous and continued fighting during the present war, enabled the French to repulse the Prussian attack of 1792, and nearly eighty years later, in 1870, at the time of the Franco-Prussian war, concealed the maneuvers of the Germans before their crushing defeat of the French in the battle of Sedan. To the westward the forest of Orleans is said to have given the French the opportunity of rallying for their final stand in 1871; while to the eastward the forest of Soignes, by the shelter which it offered to Wellington's forces, contributed to the defeat of Napoleon at Waterloo.

That the French Government itself recognizes the forests as a means of defense is shown by a provision in the Code Forestier, adopted in 1829 and still the forest law of the land, that private owners can be prevented by the Government from clearing away forests at the frontier wherever these are deemed necessary for defensive purposes. There can be no question but that they are in fact a decided advantage to the army having possession of them. First of all they offer a serious obstacle to the advance of the enemy. Troops can not march nor can artillery trains be transported rapidly through dense woods, particularly when it is possible to block the few roads leading through them by fallen trees. In Alsace, so I was informed by an eye-witness, the first step taken by the Germans after the declaration of war was to barricade every road as effectively as possible in this way. Presumably the French did the same thing in their own country wherever they were forced to retreat. That the blockades established in this way were effective in checking the advance and wasting the strength of the enemy can hardly be questioned.

Furthermore, the forest forms an excellent shelter from which an army can fire upon an advancing enemy, while itself remaining in comparative security. It is easy to imagine an infantry or a cavalry charge across an open plain against an opposing army entrenched on the edge of a forest being repulsed with tremendous loss. On the other hand, there would be situations, particularly in level country, where the forest would present a serious obstacle to artillery fire, and considerable areas have probably already been cut over, in this as in other wars, to afford a



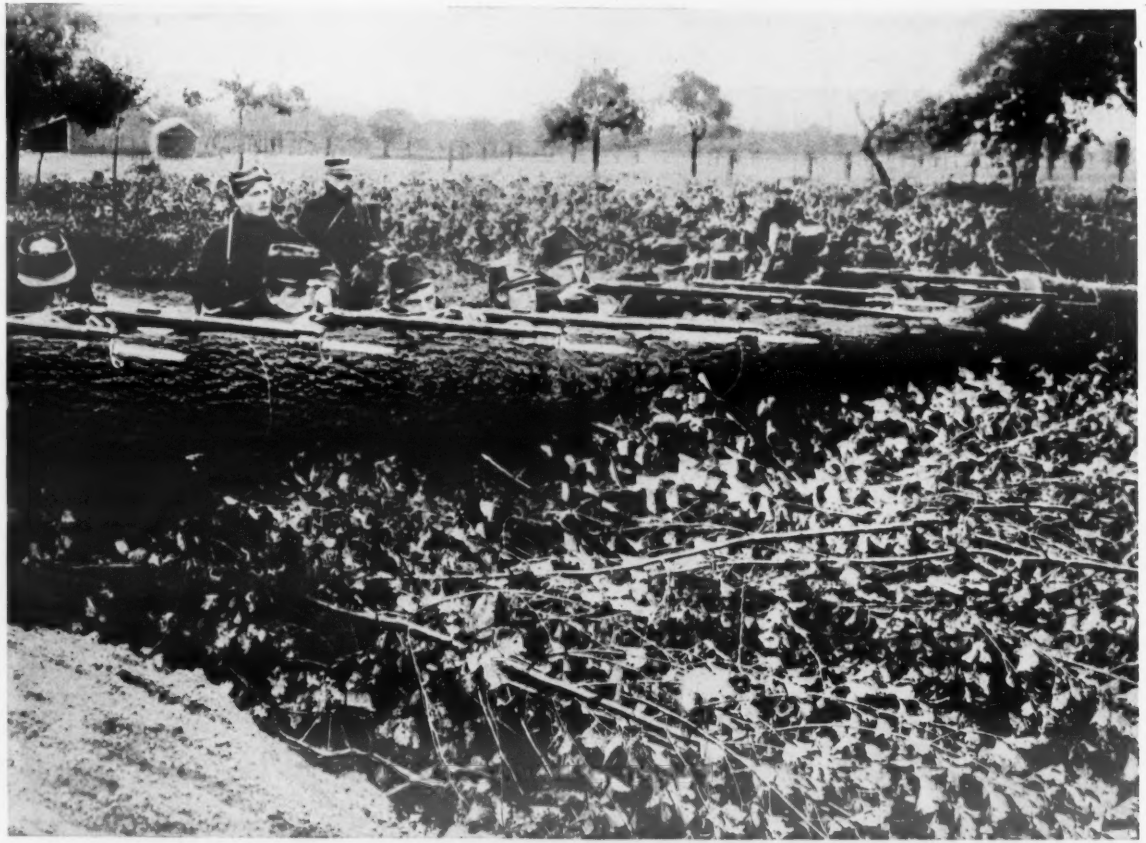
A Forest in Northeastern France.

ON SUCH LAND AS THIS THE TROOPS OF BOTH SIDES FIND HIDING FROM THE SPYING AIRMEN, AND THE COMMANDERS CONSIDER IT A GREAT STRATEGICAL ADVANTAGE TO THUS BE ABLE TO MASK THE MOVEMENTS OF THEIR MEN.

clearer field and wider range for the batteries.

The value of a wooded cover in masking fortifications must also not be overlooked. A correspondent with the German army in describing the fortifications about Metz has stated that they were so skilfully concealed by woods and blended with the hillsides that nothing out of the ordinary was apparent. This is in striking contrast to the forts at Liège which, being unprotected in this way, stood out so boldly against the sky line as fairly to invite bombardment. The correspondent further stated that in one particular battery which he visited overlooking the River Meuse, the guns were placed behind a screen of thickly branching trees with the muzzles pointing to round openings in this leafy roof. Even the gun carriages and tents were screened with branches, while a hedge of boughs was constructed around the entire position as a protection against spies. This battery had been firing for four days from the same position without being discovered, although French aviators had located all of its sister batteries so accurately that they had suffered considerable loss from shrapnel fire.

The present war is, of course, the first in which the forests have exercised this important function of concealing the positions and numbers of the various armies from the vigilance of the enemy's airmen. In open country nothing is more simple than for an aviator to determine with considerable accuracy the strength, position, and movements of the enemy's forces. In a forest this is impossible, and to the concealment which it affords can probably be attributed mainly what few surprises the strategists of the contending countries have been able to bring about in spite of aviators and spies. To the latter the



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BELGIANS USING A TREE AS A BARRICADE.

WHEREVER THERE WAS OPPORTUNITY TO CHECK THE ADVANCE OF THE ENEMY IT WAS FOUND VALUABLE TO SHELTER THE MEN BEHIND FELLED TREES. NOTE HOW ALL THE YOUNG GROWTH HAS ALSO BEEN CUT DOWN TO CLEAR THE ZONE OF FIRE FROM OBSTRUCTION.

From The Illustrated London News.

HAVOC AMONG WAYSIDE TREES.

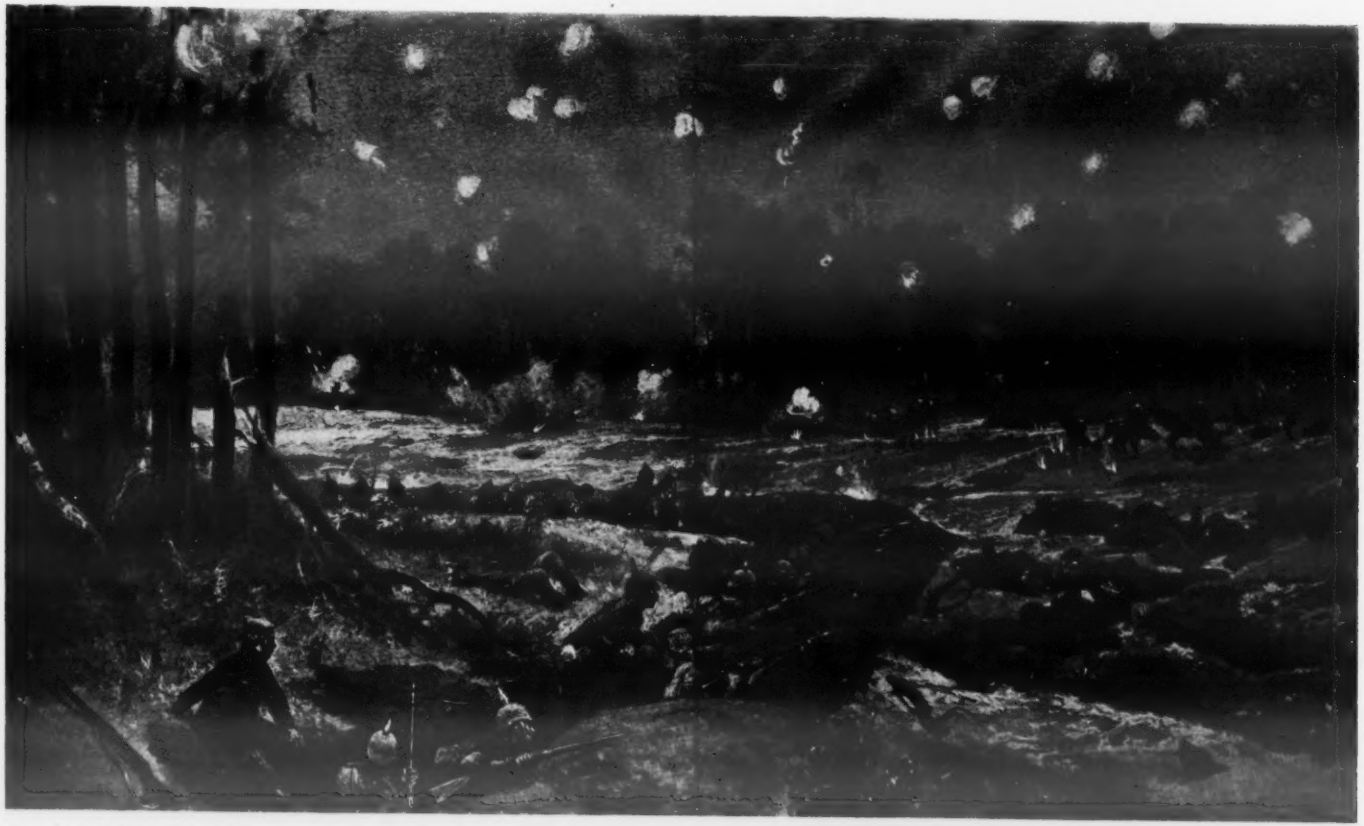
ON ROADS ALONG WHICH THERE HAS BEEN MUCH FIGHTING MOST OF THE TREES ARE DESTROYED EITHER BY ARTILLERY FIRE OR ARE CUT DOWN TO MAKE BARRICADES OR HAMPER PURSUIT. ON THIS ROAD THE GERMANS PASSED ON THEIR RETREAT FROM THE MARNE.

forest offers an excellent opportunity for effective scouting. Natives of the country, thoroughly familiar with local conditions, find it comparatively easy to steal by outposts and to observe the enemy without being detected.

In the war zone of northeastern France conditions as regard forest cover vary widely. In the roughly rectangular area to the northeast of the Seine and northwest of the Oise, the country is for the most part very flat, and is almost wholly given up to agriculture. To the south of the Oise and the Aisne, it becomes more undulating, with low hills, and here the farming land is interspersed with patches of forest and woodland. Still farther to the south and east along the Meuse River and in the Vosges Mountains, the country becomes still more rugged and the forests more abundant.

The topography and the distribution of the forests throughout this region probably account largely for the decision of the Germans to hurl their main attack against France through Belgium rather than through the more difficult route to the south. To these factors can also be attributed in large measure the rapid advance of the right wing of the German army in the early stages of the war, while the left made little or no progress. In the north the comparatively level, unwooded country interposed practically no obstacle to the free movement of the armies, and as a result the early advance of the Germans here was almost incredibly swift. During the same period, farther to the south in the region of Verdun and Nancy, the rugged, heavily wooded country, in conjunction with fortifications and strongly entrenched troops, held both armies practically stationary.

To what extent the forests in the war zone will be injured during the progress of the war is problematical. That they will suffer more or less, however, can not be doubted. Much wood will be



From the Illustrated London News.

NEAR THE FORT FROM WHICH RHEIMS CATHEDRAL WAS SHELLED.

A FRENCH ATTACK ON A GERMAN ENTRENCHED POSITION DURING THE SIEGE BATTLE OF THE AISNE. IN THIS TERRIFIC FIRE TREMENDOUS DAMAGE WAS DONE TO BOTH MATURE TREES AND YOUNG GROWTH. IN THE WOODS IN THE VICINITY THE BATTLE RAGED FOR MANY DAYS.

THE FOREST OF FONTAINEBLEAU.

HERE WERE GATHERED MANY THOUSANDS OF FRENCH RESERVES, DURING THE TIME THAT THE GERMAN ADVANCE WAS DRAWING CLOSE TO PARIS. THIS IS A WELL STOCKED MIDDLE AGED STAND OF EUROPEAN OAK.

cut for fuel and construction work; trees will be felled to block roads; whole stands may be leveled to clear the way for artillery fire; and the rain of shot and shell will do much damage to standing trees, much more than the damage done similar forests in the Franco-Prussian war. Equally serious will be the havoc wrought by forest fires. These will be set not only by accident, but also purposely in order to harass the enemy. This was the case in the Forest of Compiègne, which is said to have been fired by the British in order to drive out the Germans. While the fire may have been effective from this point of view, it also doubtless destroyed very largely the natural beauty of the famous forest and seriously disarranged the carefully laid plans for its management. If the war lasts as long as experts predict, it is certain that large sections of the forests in which the armies will operate will be cut down for fire wood. To date it is evident that there has been much cutting of young growth to use as screens in hiding entrenchments and masking batteries. Cathedrals and other edifices are not the only objects that have been devastated. Like the cities and towns, the forests will for many years bear unmistakable evidence of the ravages of war, and in many cases the damage done them will take much longer to repair.

And what of the character of the forests which are having such an important influence on military operations and which will in turn be so profoundly affected by them? The achievements of the French foresters in reforesting large areas of barren sand dunes and limestone wastes and in controlling mountain torrents have been widely proclaimed. Less is known, however, of French forestry and forest conditions in general, and a brief account of a few typical forests in the war zone may therefore be of interest at the present time.

Near Compiègne, the scene of Joan of Arc's capture in 1430 and of a Ger-

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GERMANS ON DEFENSE IN THE VOSGES FORESTS.

GERMAN INFANTRY TAKING ADVANTAGE OF THE SCREEN AFFORDED BY A PATCH OF WOODS WHILE BEING ATTACKED BY THE FRENCH IN THE VOSGES MOUNTAINS. HERE THEY WERE EXPOSED TO A GALLING RIFLE AND ARTILLERY FIRE AND MUCH DAMAGE WAS DONE TO THE TREES BY THE BULLETS AND SHELLS. THUS PIERCED AND INJURED THE TREES ARE EASY PREY FOR INSECTS AND DISEASE.

Courtesy of the New York World.

TREES FELLED TO DEPRIVE THE ENEMY OF COVER.

HOW MANY A TRACT OF WOODLAND AND OF FOREST WAS CUT DOWN TO PREVENT THE GERMANS TAKING ADVANTAGE OF THE GOOD COVER AFFORDED BY WOODED LANDS. TREE TRUNKS THUS SECURED ARE FREQUENTLY USED IN BARRICADES OR IN TRENCHES.

man victory in the present war, lies the state forest of Compiègne where there has been severe fighting. This forest, which is situated at the junction of the Aisne and Oise Rivers, only 52 miles northwest of Paris, comprises 36,072 acres and is the fourth largest state forest in France. As in most of the other forests in this part of the country, the principal trees are oak, beech, and hornbeam, with a few other broadleaf trees and a small representation of conifers. Although the growth in general is rather slow because of the poor soil, one oak, popularly known as the "king of the forest," is said to be the largest oak tree in France. It has a total height of 118 feet, a circumference of 17 feet at breast-height, and an estimated volume of 1,120 cubic feet. While these figures do not seem very large in comparison with the sizes commonly reached in this country by such trees as yellow poplar and cottonwood, its estimated value of nearly $500 undoubtedly exceeds that of any individual tree of these species here.

Previous to the war the forest of Compiègne, with its wealth of old oaks and its network of roads, was regarded as one of the finest in France, rivalling even the famous forest of Fontainebleau. One section of the forest, known as the Beaux Monts and comprising some 1,753 acres, has in fact been set aside for special treatment to preserve its natural beauty. Near by is the fine old palace of Compiègne, which, with its valuable decorations and furnishings, was a favorite residence of the two Napoleons. A striking feature of the scenery here is an avenue 150 yards wide and 5 miles long, cut through the forest by the first Napoleon in order to afford a pleasing view from the palace.

All of these facts, together with its proximity to Paris, have combined to make the forest of Compiègne a favorite hunting resort. Up to 1870 it had been for centuries the hunting and shooting ground of the rulers of France, and since the establishment of the present republic it has been equally popular with the nobility and wealthy members of Parisian society. Some 2,000 acres are now reserved as a game preserve for the President of the Republic and the State guests. In recent years the revenue from hunting licenses alone has amounted to nearly $20,000 a year, out of a total gross revenue of $167,000. It is interesting to note, however, that this use of the forest has its drawbacks from a strictly forestry point of view. The preservation of the game, and especially of rabbits, endangers the young growth to such an extent that it is necessary to fence most of the areas under reproduction, of course with greatly increased expense of management.

A short distance to the southeast of Compiègne lies the little village of Villers-Cotterets, the birthplace of the elder Dumas and formerly the seat of an important secondary forest school

From the Illustrated London News.

EFFECT OF A SHELL ON A TREE.

THIS TREE WAS STRUCK BY A BRITISH SHELL DURING AN ATTACK ON GERMANS HIDDEN IN HEAVY WOODS, AND WAS ONE OF A LARGE NUMBER DESTROYED DURING THE SEVERE FIRING,

A Forest in Northwestern France.

FOREST OFFICERS SUCH AS THESE SEEN IN THE PICTURE WERE AMONG THE FIRST CALLED TO THE FRONT AND ALREADY MANY OF THEM ARE NUMBERED AMONG THE DEAD, WOUNDED OR MISSING. SUCH AREAS HAVE BEEN THE SECNE OF MANY VIOLENT ENCOUNTERS BETWEEN THE ALLIES AND THE GERMANS.

for the training of subordinate forest officers. The town is surrounded on three sides by the state forest of Retz, where French reserves were encamped at the time the Germans were so close to Paris. This is an area of 32,044 acres situated between the Aisne and the Oureq Rivers. In many respects this closely resembles the forest of Compiègne, with which it compares favorably, having, indeed, the reputation of being one of the finest and best managed beech and oak forests in France. Although situated at a slightly higher elevation, from 200 to 800 feet above sea level, the topography is practically the same and in both forests the stand is composed mainly of oak, beech, and hornbeam. A century or so ago the forest contained some splendid specimens of oak, which were used for the French navy. Since then, however, the oak has been largely cut out and the proportion of beech has increased to an undesirable extent. Consequently the aim of forest management here, as in most of the broadleaf forests of France, is to increase the amount of oak. In 1672, during the administration of Colbert, Louis XIV's noted minister of finance, a system of cutting known as "tire et aire" was introduced, which provided for what was practically a clear cutting with the retention of about 8 beech or oak trees per acre to serve as standards for the production of large-sized material and to furnish seed for natural reproduction. Although not entirely satisfactory in its results this system was continued until 1830, when it was superseded by the shelterwood system, which is still in vogue. Natural reproduction is also assisted to some extent by oak planting, at a total cost of nearly $20 per thousand plants.

Like the forest of Compiègne, the forest of Retz is also a favorite hunting ground because of its proximity to Paris,

By Courtesy of the New York World.

BARBED WIRE ENTANGLEMENTS OUTSIDE OF ANTWERP.

BOTH THE ALLIES AND THE GERMANS HAVE FELLED THOUSANDS OF TREES TO MAKE POSTS FOR STRINGING BARBED WIRE ENTANGLEMENTS LIKE THESE SHOWN IN THE PICTURE, OUTSIDE OF CITIES AND IN FORTIFIED PLACES ALONG THE BATTLE FRONT.

its natural beauty, and the abundance of game. It is, however, not quite so popular, and the annual income from hunting and shooting leases averages only about $7,000. When damage to surrounding crops is caused by the game, particularly the red deer, the lessee of the hunting license is forced to make good the damage to the injured farmer.

An interesting feature of the timber sales here is that they are all made in September of each year by "Dutch auction." The trees are first offered at a price higher than it is actually expected to realize, and this is then called down by the auctioneer until some one cries out "je prends" (I take). An annual revenue of about $122,400, or approximately $3.80 per acre, is received from sales of wood alone. Another interesting feature is the utilization of the heavy crops of beech nuts which occur about once in every seven years. One year, salad oil to the value of $30,000 was made from them, in addition to 300 bushels of seed being sent to other forests in France and sufficient seed retained to restock the cut-over areas. Among the various wood-working industries in Villers-Cotterets is an establishment which turns out annually 400,000 pairs of wooden soles. These are made chiefly by boys and cost 2 cents per pair for labor and 5 cents for wood.

In the extreme north of France, only 65 miles from the North Sea and almost touching the Belgian frontier, lie the state forest of Amand and the private forest of Raismes, in which desperate fighting has recently been reported. Near them is situated the town of Valenciennes, formerly best known as the birthplace of Froissart and Watteau and as the original source of the famous lace of the same name, and recently unenviably prominent in the war despatches.

The forest of Raismes forms a compact area of 3,500 acres, which is surrounded on three sides by the State forest of Amand, comprising 8,190 acres. The latter formerly belonged in part to the abbeys of Vicogne and St. Amand, but at the time of the French Revolution these ecclesiastical possessions were confiscated and joined to the rest of the state forest. The country here is low and flat, having an elevation of only 50 to 100 feet. Owing to its nearness to the coast, the temperature is more equable than farther inland, but because of the lowness of the land late spring frosts are likely to be severe. The forest areas are underlain with coal, and mine galleries extend in all directions below the surface. These often cause a sinking of the land with the formation of swamps and subsequent death of the trees. Sometimes the swamps are filled up with refuse from the mines and replanted.

SCENE OF CONSIDERABLE FIGHTING.

IT IS IN SUCH A COUNTRY AS THIS IN WESTERN FRANCE THAT MANY OF THE MOST STUBBORN CONFLICTS BETWEEN THE FRENCH AND THE GERMANS ARE REPORTED.

Unlike the forests nearer Paris, already described, those near Valenciennes contain comparatively little beech. Oak and hornbeam form the chief species, while nearly a fourth of the State forest is composed of Scotch pine. The latter has mostly been planted since the Napoleonic wars on areas which were previously bare heather land. Parts of the forest are managed as coppice under a rotation of from 14 to 25 years, usually also with some standards, while in other parts an effort is made to secure nearly all seedlings. The importance which the French attach to the protection afforded the soil by a forest cover is shown by the fact that they actually plant such species as hornbeam, ash, alder, and sycamore, to serve as an undergrowth and to prevent the drying out of the soil which might result from the excessive opening up of the main stand.

To the southeast of Valenciennes and Maubeuge, where the big fortress was captured by the Germans early in the war, lies the region known by the general name of Ardennes. Long ago in the days of the Roman occupation this region occupied a vastly greater area than at present, and extended eastward as far as the Rhine. Caesar in his Commentaries described it under the Latin name of "Arduenna silva" as the largest forest in Gaul. With the advance of civilization, however, the forest was gradually cleared away until now the region is restricted to an area some 100 miles long by 40 miles wide divided about equally between France and Belgium. Topographically, the region consists of a series of plateaus, with an elevation of from 900 to 1300 feet and much cut up by deep ravines and valleys, in some places with precipitous cliffs 600 feet high. These conditions contributed largely to the desperate character of the recent fighting in this region. The area is now drained by the River Meuse, a tributary of the Rhine. Geologists believe, however, that in prehistoric times the rivers from this area deposited their sediment on what is now the city of London, since the London basin is the only other place

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SHADE TREES BARRICADING PARIS STREETS.

WHEN THE GERMAN ADVANCE WAS RAPIDLY APPROACHING PARIS AND THE GOVERNMENT FEARED ITS CAPTURE MILITARY ENGINEERS DIRECTED THE BARRICADING OF THE STREETS IN THE OUTSKIRTS. FELLED TREES WERE FOUND TO FORM ADMIRABLE BARRICADES AS THEY HAD DONE ON THE ROADS OVER WHICH THE ALLIES HAD RETIRED FROM THE BELGIUM BORDER BEFORE THE GERMANS. THOUSANDS OF TREES WERE FELLED TO BLOCK THESE ROADS.

FOREST ON THE VOSGES MOUNTAINS.

MUCH OF THE FIGHTING IN EASTERN FRANCE HAS BEEN ON GROUND SUCH AS THIS. HERE IS A 100 TO 150 YEAR OLD STAND OF SCOTCH PINE AT AN ELEVATION OF 5,500 FEET. CONIFEROUS FORESTS OF THIS SORT OCCUPY THE UPPER SLOPES IN THE MOUNTAINS.

where the particular clay soil characteristic of this region is found.

While a large part of the Ardennes is forested, there are also considerable areas of marshes, heaths, and barrens. Agriculture is mostly confined to the valley bottoms and is not extensive, but large numbers of sheep and cattle are grazed. The forests are for the most part composed of the oak and beech typical of so much of France. As elsewhere the stands are managed both for coppice and seedlings. Like the country to the northwest, the region is underlain with coal which is being brought to the surface by numerous mines. The ugly

piles of slag and pit rubbish which are so abundant in similar mining districts in England are, however, apparently scarce. This is due to the fact that these heaps are frequently planted with larch, birch, and other trees, which grow surprisingly well on such sterile soil. In spite of the fact that it is usually necessary to bring in small quantities of earth in which to plant each tree, the result is said to be fairly profitable to the mine owners and is certainly a great benefit to the public from an artistic and health point of view.

A part of the Belgian Ardennes of special interest to foresters is the private forest of Mirwart, which from 1891 to 1903 was the property of Dr. Schlich. When he acquired possession of the area it consisted of some 100 acres of Scotch pine and 2,700 acres of mixed broadleaf trees in a most irregular state. Having observed that Norway spruce had grown remarkably well in the few experimental areas and that the wood was in much demand in the neighborhood for pit props, he determined to convert the greater part of the forest to spruce as rapidly as possible. This work, which has been carried out at a cost of about $20 per acre, has apparently been very successful. One of the principal difficulties encountered was the fondness of the red deer for young spruce shoots. It was found that this damage could be prevented, to a considerable extent at least, by sprinkling the trees liberally with whitewash, particularly in the spring.

South of the Ardennes is the forest of Argonne, concerning which so much has been heard in the present war as the scene of many vigorous encounters. The region to which the name is commonly applied comprises a rocky, forest-clad plateau some 63 miles long by 19 miles wide extending from the plateau of the Ardennes on the north to the plateau of Haute Marne on the south. On the east it is bounded by the River Meuse and on the west by the Aisne and the Ante. In this district have been some of the most sanguinary engagements of the war. The plateau has an average elevation of about 1,150 feet, and, like the Ardennes, is much dissected by many precipitous gorges. In addition to its numerous forests of oak and beech, the region is excellently suited to form a natural barrier to any hostile invasion because of the fact that the Aire and other rivers traverse it lengthwise parallel to the French border. The heavy forest cover, the roughness of the country, and the necessity of crossing instead of following up the streams, all conspire to render difficult the advance of an army. It was here that Dumouriez in 1792 held the Duke of Brunswick in check and, by giving the French forces time to rally, made possible the subsequent defeat of the latter at Valmy. In the present war history seems to be repeating itself, and the forest of Argonne has evidently been largely instrumental in helping to prevent the advance of the Germans in that region, when in the more open, level country to the north the movements of both armies covered much wider areas.

Southeast of the forest of Argonne on the Moselle River, only about 10 miles from the border of Lorraine, is the town of Nancy, one of the principal military posts in France and one of the chief objectives of the attack by the German left wing. It is the seat of the only French forest school for the training of technical foresters, although there is another school for the education of subordinate forest officers at Barres. The school at Nancy was established in 1825, up to which time the Government forest service had been made up chiefly of retired army officers who were not specially trained for the work. One of the interesting points connected with the early history of the school is that its first directors were severely criticized for their "unpatriotic" tendency to advocate methods of forest management in vogue in Germany, where they themselves had received their education. So deep-seated was this feeling that the very existence of the school was several times threatened and the first director, Bernard Lorentz, is said to have been dismissed for this reason. The school is organized along military lines and offers a three year course including both theoretical and practical instruction, with considerable field work in the neighboring forests. Only a limited

WHERE WAR'S DAMAGE WILL BE SLIGHT.

A SERIES OF DAMS ON A MOUNTAIN IN NORTHWESTERN FRANCE, FOR CHECKING EROSION. THE MOUNTAIN SIDES WERE REFORESTED WHEN THE DAMS WERE CONSTRUCTED. THERE HAS BEEN MUCH FIGHTING ON SUCH TERRITORY AS THIS WITHOUT MUCH DAMAGE TO THE FORESTS.

number of students, chosen from graduates of the Institut Agronomique, are admitted and on completion of the course are employed by the Government.

West of Nancy lie the two state forests of Champenoux and Haye. The former with an area of 3,509 acres, is situated on the plain between the rivers Meurthe and Seille; while the latter, comprising nearly 16,000 acres and forming part of a larger wooded area of 27,210 acres, occupies the plateau between the Meurthe and the Moselle. East of Nancy are the forests of Bazange and Parroy where battles were fought during the last week of October. In the forests to the west the principal species are oak, beech, and hornbeam in all stages of conversion from coppice to seedling stands. An interesting feature of the forest of Champenoux is the arboretum of 25 acres established in 1900. Here the various trees planted are grouped both by species and by the countries of their origin. Of the American species experimented with, the white ash, yellow poplar, and western red cedar are said to be particularly thrifty. The soil in the forest of Haye is remarkable for its tendency to dry out, and must be kept constantly covered by a crop with dense foliage in order to maintain its fertility. Parts of both forests are under the management of the forest school at Nancy, which uses them for experimental purposes.

The forests in the Vosges Mountains, to the southeast of Nancy, where there have been numerous engagements, are of a very different character from those already described. The state forest of Celle, for example, which includes an area of 2,925 acres near the town of St. Dié, not far from the border of Alsace, comprises 90 per cent of silver fir and only 10 per cent of beech with a few scattering Norway spruce and Scotch pine. The area has an elevation of from 1,300 to 2,600 feet, and in places the mountain slopes are so steep as to make it impossible to use horses for logging. The forest has some fine

specimens of silver fir. Many of them are 11½ feet in circumference at breast-height and 130 feet tall, while one is 13¼ feet in circumference and 140 feet tall. In the best parts of the forest the older stands yield 7,000 cubic feet per acre with a money value of $1,000. For a time the forest was managed under the shelterwood system, but serious windfalls showed that this system was not suited to mountain conditions, and it has now been superseded by the selection system.

Farther south in the Vosges Mountains lie the communal and state forests of Gérardmer, comprising respectively 2,359 and 11,897 acres. The former has 58 per cent of Norway spruce, mostly planted, 40 per cent of silver fir, and 2 per cent of Scotch pine; while the latter has 50 per cent of silver fir and 25 per cent each of Norway spruce and beech. One tree, known as the Géant Sapin (giant fir), has a circumference of 14½ feet, a height of 157 feet, a volume of 1,095 cubic feet, and is valued at nearly $135. Curiously enough the beech is particularly abundant at high altitudes, and near the top of the Hohneck occur pure stands of stunted beech with an occasional dwarf silver fir. The general elevation, from 2,000 to 4,000 feet, is considerably higher than that of the forest of Celles, and windfall is more frequent. In February, 1902, for example, a severe storm blew down 292,500 cubic feet of timber and emphasized strongly the necessity of substituting the selection for the shelterwood system of cutting in the mountains.

The forests described briefly in this article have since the war began played an important part in the operations of both sides. Offering, as they do, an effective and very necessary screen from the vigilant airmen, it has been considered of marked advantage by commanders of the armies, to hold them. They are more easily defended than open country, the trees and underbrush are of immense service in making entrenchments and in blocking roads during a retreat, and they have been used whereever possible for masking artillery.

Military men assert that forests and woodlands have been of greater practical service in this war than ever before, chiefly owing to the protection they afford bodies of troops from spying airmen who direct artillery fire on the enemy's positions.

Hence it is certain that any forests or woodlands within the fighting zone will be an objective for opposing commanders, and that these forests and woodlands will, during the progress of the war, continue to be the scenes of hard-fought engagements.

Wood Preserving Pointer

Recent experiments indicate that round timbers of all the pines, of Engelmann spruce, Douglas fir, tamarack, and western larch, can be readily treated with preservatives, but that the firs, hemlocks, redwood, and Sitka spruce, in the round, do not take treatment easily. This information should be of value to persons who contemplate preservative treatment of round posts, poles, or mine props.

FIRES

By Bristow Adams

The District Forester Speaks:

I wish I were out with the fellows—
  Just my luck to be stuck here in town;
But I've got to sit tight when I'd heap rather fight
  To help keep these brush blazes down.
I'm sick of this end of the business.
  The ring of the querulous phone,—
The telegrams, too, of flames breaking anew
  While I have to stand it alone,
  And I'll own
  It's hell to be watching alone.

There's Bill—he's gone out with the pack train,
  And Jim—he's to rustle the grub
For the men on the line, and he's doing it fine
  While I'm sitting here like a dub;
The fellows are working like demons,
  They're scorched and they're blistered—no less,
While I stay and chafe and am damnably safe
  When I'd like to mix up in the mess;
  Well, I guess!
  That the buck-brush ablaze is a mess!

In a swivel chair—well, it's the limit—
  With the rest in the thick of the fight
With their lungs all a-choke with the dust and the smoke,
  And sweat in their eyes day and night;
But I've got to look out for the labor—
  This calling for troops makes me sick;
There's none seems to know if the troops ought to go;
  Neither begging nor blarney nor kick
  Brings 'em quick,
  So it's no use to blarney or kick.

So here I am pacing the office
And "watchfully waiting" returns
From lookouts for days all enveloped in haze
Where half of a mountainside burns;
I've drawn in my men to where danger
Is worst where dry desert winds go,
And I'll be in a hole if my extra patrol
Can't hold in the face of a blow;
And I know
They *can't* hold in front of a blow.

I'm afraid there will be a hitch somewhere,
There's no telling where it will be,
But I'd rather be found right there on the ground—
Right out there to think, act, and *see!*
I won't care for second-hand versions
Of how the disaster befell,
But I'll choose all the brunt of the scrap at the front
Instead of this telephone bell;
And it's hell,
To depend on this telephone bell!

Out there are my Supers and Rangers,
With lumberjacks, men from the mills,
From fields and from slums, hoboes, tie hacks, and bums,
And ranchers who know all the hills;
While I'm here with no smoke in my nostrils,
I am here with no scorch on my cheek,
When I'd rather be there with singed eye-brows and hair
Than stuck in here week after week.
Hear me speak!
I'll be bughouse inside of a week!

Photo by Neal T. Childs.

TYPICAL MOUNTAIN MEADOW IN THE SIERRAS.

THIS IS AT AN ELEVATION OF 6,000 FEET. HERE IS THE GREENEST OF GRASS, THE RICHEST OF FORAGE, AN UNLOOKED-FOR BEAUTY SPOT IN THE HEAVY FOREST COVER.

THE MEADOWS OF THE SIERRA

By NEAL T. CHILDS

THE mountain meadows are the most distinctive feature of the Sierra landscape. They impress the new traveller the most, and the impression remains longest. The mental picture of countless mountain meadows lingers longer than the majestic quiet of Sequoia groves or the glint on the lofty granite needles of the High Sierra.

In the Rockies, the Cascades, and the Coast Ranges, the traveller is content with an occasional meadow; in the Sierras he depends on them. He may rein his horse from Tehachapi Pass on the south to Mt. Shasta on the north, a journey of five to seven hundred miles, and camp in a meadow every night, provided only that he keep above 3,000 feet.

The Sierra meadows vary in size from a grass plot the size of a respectable city lawn to areas covering two townships. Such a one is the great Monache Meadow at the head of the Kern River. The Monache includes about 40,000 acres of grassland.

Some are quite regular in shape, being almost perfect circles or ovals cut in the forest canopy; others are irregular, with many grass arms or "stringers" running into the timber. These stringers usually follow gurgling brooks to their source in some springy swale.

So far no one has ever made a count of the meadows, though the Forest Service through its grazing and timber reconnaissance has a fair idea of the amount of grass land contained in the meadows on each National Forest.

To the easterner, the first mountain meadow is a distinct surprise. He walks his horse through the gloom of a heavy fir cover around a twist in the trail, through a thicket of saplings out into the bright sunlight lying on a lawn-like floor of the greenest of grass. The change from heavy tree trunks, purple shadows, and a brown carpet of needles is so abrupt that it startles one. Im-

Photo by Neal T. Childs.

PATTENING BEEF STEERS ON A MOUNTAIN MEADOW.

HERE AT AN ELEVATION OF EIGHT THOUSAND FEET IS FOUND EXCELLENT FEEDING. THIS IS ONE OF THE MEADOWS OF THE SIERRAS ON WHICH THE FOREST IS CONSTANTLY ENCROACHING.

mediately he is seized with the desire to stop in this pleasant place. His horse is already cropping. He unsaddles and seeks out the brook which he knows must be running through the grass.

The meadows are the favorite camping place of the Sierra tourist. Here under the fringing Lodgepole pines he may pitch his tent, build his rock fireplace, and find abundant down wood. His tired and sweaty pack animals find rest and food, while the meadow stream furnishes water for the pot and often trout for the pan. So popular are certain meadows as camping places that the Forest Supervisor sets them aside for Tourist Pastures, the Government cooperating with the counties and recreation clubs in fencing them. Here the camper may for a number of days rest and feed his stock, while he enjoys camp life.

As grazing grounds mountain meadows are invaluable to the cattlemen. When the California sun has made the foothill pastures unbearable and the first lush grass of spring is gone, the cattle climb to the higher hills where the meadows furnish abundant food and water. Under the wise policy of the Forest Service these sky scraper grazing grounds are proportioned out among the cattlemen. Each permittee has sufficient range for his cattle. For this privilege he pays perhaps sixty cents per head for the entire season. From April to September his cattle range through grass parks or over bushy slopes where tender browse is found. In addition he may for a moderate rental hold a "special use" on a mountain meadow. He may fence it, irrigate it, and enjoy complete use of it so long as he fulfills the simple requirements of a permittee. These fenced meadows where the grass is protected during the early summer make wonderful fattening pastures for the beef cattle. One often sees bands of splendid horses in these upland pastures. From a standpoint of beef and horse flesh, the mountain meadows are a very valuable asset to the California cattlemen.

At elevations below five thousand feet, mountain meadows, while of little value for grazing, often prove valuable for agriculture. The deep black silty loam produces excellent rye, corn, potatoes, and garden vegetables. If a little water can be led in from above, so much the better. One thing must be guarded against—rapid erosion of the

Photo by Neal T. Childs.

HORSES GRAZING IN A MOUNTAIN MEADOW.

FROM A STANDPOINT OF BEEF AND HORSE FLESH THESE MOUNTAIN MEADOWS ARE A VALUABLE ASSET TO SETTLERS AND CATTLEMEN.

Photo by Roscoe Parkinson.

A Glacier Lake—the Forerunner of a Mountain Meadow.

THIS SMALL LAKE IS AT THE EXTREME HEAD OF TYNDALL CREEK GLACIER. IT IS ABOUT FOURTEEN FEET DEEP. THERE IS GOOD FORAGE A HALF MILE WEST OF HERE

Photo by Neal T. Childs.

A Worn Out Meadow.

THIS IS NOW COVERED WITH SAGE BRUSH, JUNIPER AND YELLOW PINE. THIS IS A PROBLEM FOR THE FORESTER TO SOLVE. SHALL THE MEADOW BE IRRIGATED AND MAINTAINED AS GRAZING LAND, OR SHALL IT BE ALLOWED TO REVERT TO A FOREST AND BECOME A TIMBER PRODUCING UNIT?

soil by a meadow stream cutting back. This may be prevented, if taken early, by proper diversion, riprapping, and damming. The higher meadows will never be agricultural ground because of frequent frosts.

In addition to the cattle and horses that one sees in nearly every meadow, there is much wild life. Deer frequently graze along the marsh stringers in search of succulent plants. Occasionally a bear hunting ants or honey will blunder into a meadow. Of small mammals there are numbers, such as the woodchucks (ground bears), gophers, ground squirrels, and badgers who find good burrowing places in the soft soil. Grey squirrels, douglas squirrels, and chipmunks scamper about the edges of every meadow.

Of birds there are many, attracted by water and the abundant insect life that swarms in every meadow. Perhaps the most common bird is the Western robin. Robins in flocks of a half dozen or more hop about on these forest lawns as much at home as their eastern cousins in a well-kept park. Swallows are frequently seen skimming the surface of the larger meadows. The great grey marsh hawk finds good hunting along the little swales of meadow brooks. The beautiful mountain quail are often seen trotting in and out of the scrub on the borders of the meadows, while a heterogeneous crowd of woodpeckers, creepers, warblers and other industrious entomologists flit among the fringing pines at the meadow's edge.

To the student of evolutionary geology and physiography, the mountain meadows are as a fascinating serial story. Each meadow is a chapter in that story that begins back in the Ice Age and comes down to the present day. One may lead his pack train over a trail of broken granite to some lonely cirque high on the shoulder of the great Sierra. There he may pitch his tent on a lichen floor close to a mountain tarn in which no fish swim and along whose shore an ancient wall of ice adds drop by drop its grudging toll of crystal water. This glacier lake over whose surface no birds skim or insects hum and whose stillness is as the stillness of the eternal, is the forerunner of a mountain meadow.

To prove the case, the traveller may drop down a thousand feet and tramp over a springy lichen-covered bog, once the bed of a glacier lake. Further down

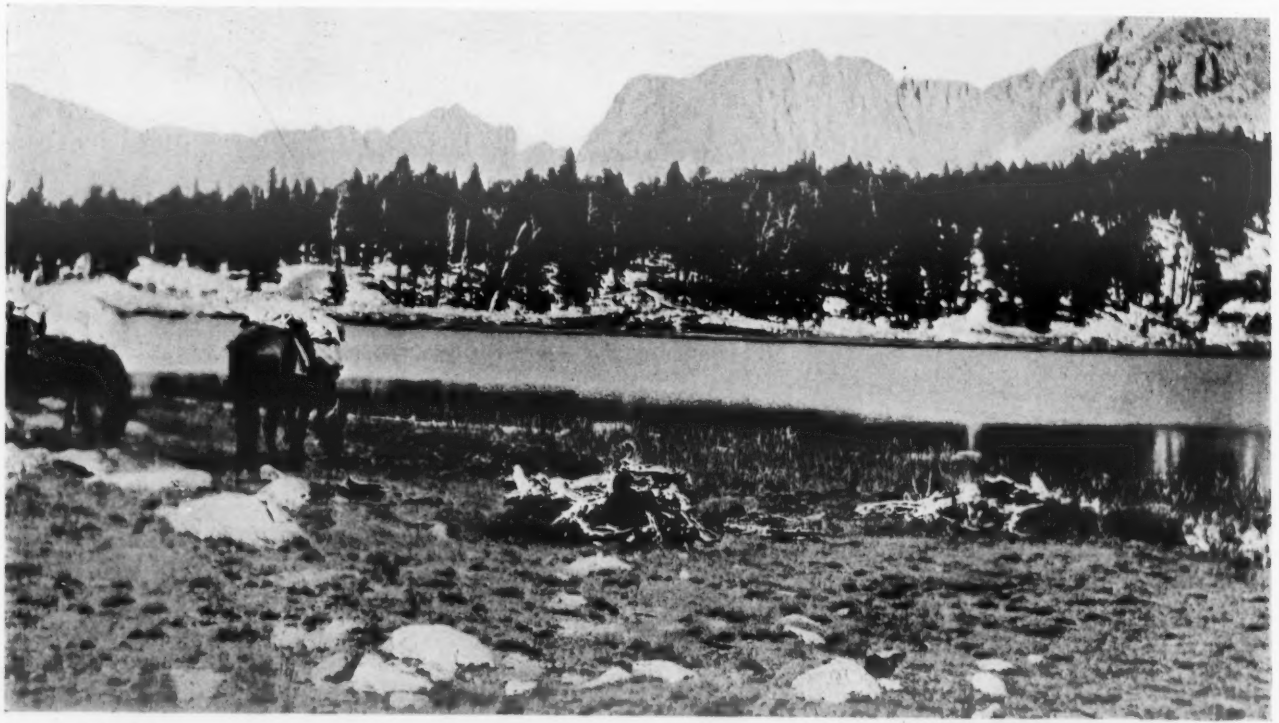


Photo by W. S. Morrow.

MONETTA LAKE IN THE SIERRAS.

ON THE FAR SIDE OF THIS GLACIER LAKE ARE SEEN FOXTAIL PINE, WHILE THE SHORES ARE FRINGED BY SEDGES. THE ABUNDANT INSECT LIFE HERE ATTRACTS WESTERN ROBINS AND SWALLOWS. THERE IS GOOD MEADOW NEAR. THE LAKE WAS SUPPOSED TO HAVE BEEN STOCKED WITH GOLDEN TROUT IN 1910 BY S. N. ELLIS BUT NONE WERE FOUND WHEN THIS PHOTOGRAPH WAS TAKEN SEPT. 12, 1912.

Photo by Neal T. Childs.

A MEADOW REVERTING TO A FOREST.

HERE THE MEADOW HAS GONE FAR TOWARD BECOMING A PORTION OF THE SURROUNDING FOREST AND IS NOW WELL COVERED WITH A NATURAL SEEDLING OF JEFFREY PINE.

he will come into a meadow where lichens give place to sedges, but along its lower borders he will find the tell-tale marks deep in the granite where the ice slipped over the saucerlike brim of what was once a glacier lake. Perhaps only stunted foxtail pine or white barked pine fringe its border and frost is here every night in the year, but the succession is plain till he reaches a level of eight to nine thousand feet when he comes to a normal meadow lush with grass and spangled with flowers. White Fir, Red Fir, and Sugar Pine come down its borders, and cattle munch knee deep in content, but along its rim lie the shells of mussels that lived in the ancient lake now long gone.

Nor is the evolution complete. Still the meadows change. You will find meadows that are changing today, meadows that have gone dry, as the mountaineer says. When the water level is lowered owing to erosion or other cause, the grass in a meadow gives way to other vegetation. Sage brush generally is the first intruder. This in turn is followed by a sprinkling of mountain juniper (*J. occidentalis*), and lastly by Yellow Pine and Incense Cedar. There are many meadows in the Sierras today which are quite rapidly reverting to the forest. Thrifty stands of pine and cedar are found where only grass cover was known.

It is in these "worn-out meadows" that the forester has a problem to solve. Shall the meadow be irrigated and maintained as grazing land or shall it be allowed to revert to the forest and become a timber producing unit? Here is a nice problem for the forest student who is interested in land values.

To the average citizen, however, it is as a natural feature that the mountain meadow will always be of chief interest. Coupled with their natural beauty there is also a thread of romance that appeals to the traveller. Once the grazing lands of the Spaniard where the herds of the great haciendas roamed at will in the far-off times before the Gringo came, the mountain meadows hold in their names some of the charm of the halcyon days. Such names as Albinita, Paloma, Bonita (pretty little place), Casa Viejo—musical names whose charm lingers like the morning mist over meadows and in these Anglo-Saxon days of grazing fees and water-power sites keep for the tourist high in the Sierra fastnesses a whisper of the romance of life in Old California.

THE REDWOOD OF CALIFORNIA

By J. H. Browne

THE opening of the Panama Canal and the completion of the Northwestern Pacific Railroad into Humboldt County, California, will mean more to the Redwood industry than anything since the manufacture of Redwood began. With the canal, will come the opportunity of marketing Redwood throughout the world in parcel lots of 25, 50 or 100,000 feet, where, heretofore, it has been necessary to sell in cargo lots of 1,000,000 feet or more to obtain advantageous freight rates. Direct rail connection with the mills in Humboldt County means a saving of from $2.00 to $5.00 per M in the cost of making Eastern Redwood shipments. This will assure the mills a better return on such of their product as is now being shipped East, and will enable them to market a large quantity of by-products which are now burnt up or sold at cost locally.

The market for Redwood was for many years uncertain and limited, its sale depending chiefly upon the California demand. The development of the Eastern and foreign business was slow, because there was no direct rail connection with the Redwood country, it being necessary to bring all shipments into the harbors of San Francisco or Los Angeles for reshipment.

The earliest logging of Redwood forests was by the Spaniards near San Francisco Bay, but their operations were very small. At the beginning of the nineteenth century, a Russian colony near Fort Ross in Mendocino County, cleared a tract of Redwood which has since grown up and again been cut over. It was not until 1850, however, that small sawmills were started at various points along the coast. These have grown until there are now eighteen or twenty more of the important mills in operation with a total annual output of 550,000,000 to 600,000,000 feet.

The biggest stands of Redwood timber are in Del Norte, Humboldt and Mendocino Counties, but there are isolated groups as far north as the Chetco River in Curry County, Oregon, and as far south as the Santa Lucia Mountains, Monterey County. The Redwood belt is from twenty to forty miles wide, the trees growing on the west slopes of the coast range.

The enormous height and diameter of the Redwood is due to the great rainfall in the autumn and winter, from thirty to sixty inches, and to the sea fogs which bathe the coast in the summer. There are two types of the Redwood, those which grow on the slopes and those on the flats or bottom lands. The Redwood slope is the common type, and it grows mixed with other woods such as Red Fir, Tan Bark Oak and White Fir. As the slopes become moderate, the altitude lower, the soil deeper and the water supply better, the Redwood steadily gains on the other species until on the rich flats there is no other tree. The extreme form of the Redwood flat is along the Eel river, and here the trees attain their greatest known height and clear length. Under best conditions these trees grow to be 350 feet high with a diameter of twenty feet. Most of the Redwoods cut are from 400 to 800 years old, and the oldest tree found during the Government investigation in 1900 was 1373 years old. The tree when normal has a straight, slightly tapered bole clear for more than 100 feet, and a crown of horizontal branches that may occupy from one third to one-half of its total length.

The enemies of Redwood are few and it suffers from them less than other trees. The wind can scarcely uproot it, insects seem to do it little harm, and fungi seldom affects it. Even fire, the great enemy of all trees, though it may occasionally kill whole stands of young Redwood growth, is unable to penetrate

WHERE SHADOWS ARE DEEP.

THE ROAD AFTER WINDING THROUGH A REDWOOD FOREST WHERE THE TREES ARE SO THICK THAT THERE IS LITTLE SUNSHINE SUDDENLY TURNS INTO AN OPEN SPACE WHERE THE SUNSHINE IS STARTLINGLY VIVID.

the fireproof sheathing of shaggy bark with which the old trees protect themselves.

The yield of the Redwood will average from 75,000 to 85,000 board feet per acre, but some of the flat lands will show a stand of 1,000,000 feet or more to the acre. It is estimated that there is standing today about 75,000,000,000 feet of merchantable Redwood timber, so that at the present rate of production there is more than a century's supply to look forward to. The value of the stumpage varies from $1.50 to $5.00 per M feet, depending upon the character of the timber and its location and accessibility. The flat timber is less expensive to log, and produces a greater amount of the upper grades. Redwood lumbering is expensive and difficult. The average cost is $5.00 to $6.00 per M. On the flat lands it will go as low as $3.00 per M. The greatest care must be taken by the choppers in felling a tree so that it will strike throughout most of its length at the same time, otherwise the wood will break and splinter badly. After the choppers have done their work, the bark is peeled and the tree cut into lengths from 16 to 40 feet. Skid roads are constructed over which the logs are hauled to the landings and loaded on cars by donkey engines on their way to the sawmills.

The cost of converting Redwood logs into lumber is from $2.50 to $3.00 per M, this cost being increased because of the waste in manufacture, and because of the large amount of small sizes which the market calls for. Some logs are so large that they have to be split before the carriage will handle them in the mills. All machinery must be of the heaviest in order to stand the strain.

In this country Redwood is used very largely for exterior finish. It is particularly valuable for this sort of work because of its lasting qualities and its resistance to fire. Redwood contains a peculiar acid which preserves the wood. Many examples can be given of buildings sided with Redwood boards and covered with Redwood shingles that are today in first-class condition after fifty or sixty years of continuous use without paint or treatment of any kind. Redwood contains no pitch of any kind, will not ignite easily, burns very slowly and absorbs moisture readily, making it easy to put out a fire. After the great San Francisco earthquake and fire in April, 1906, the Building Committee appointed by the Mayor to determine the character of buildings and materials to be used in constructing same, adopted the following resolution:

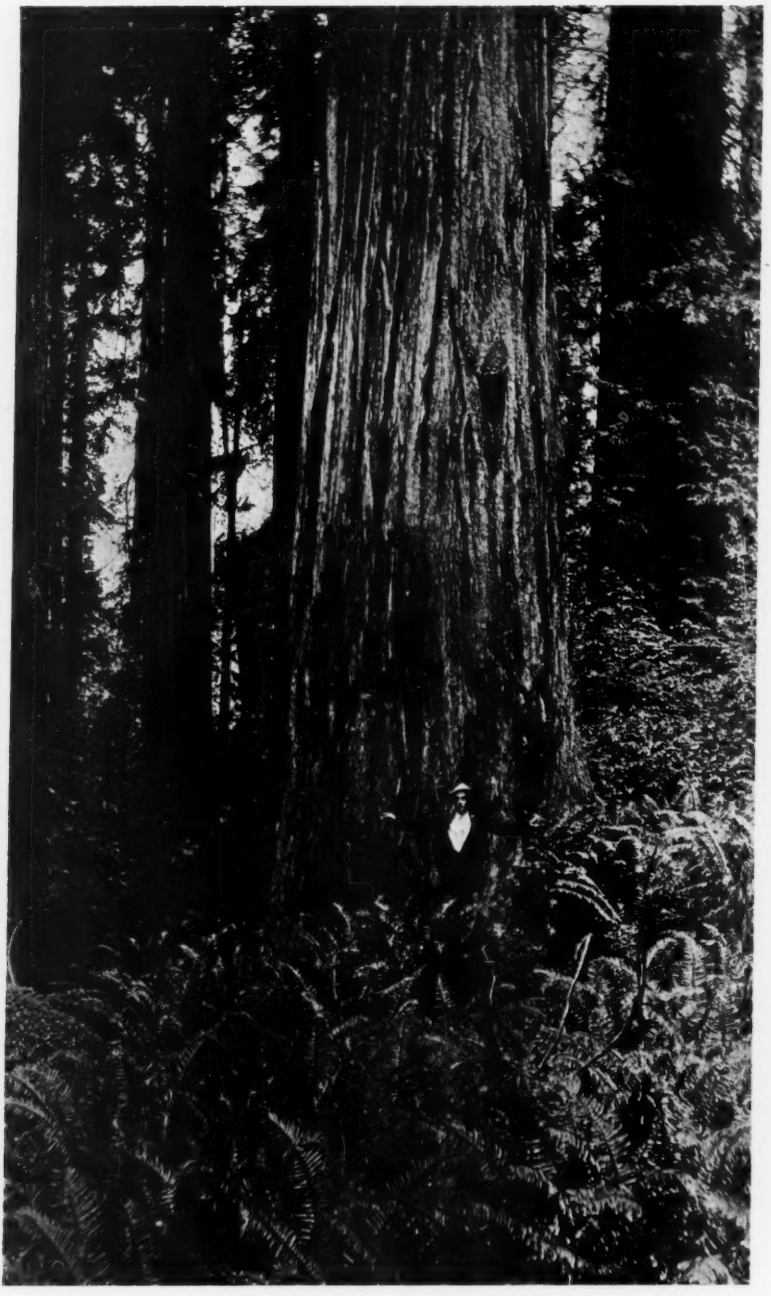
"RESOLVED that no permits will be given at the present time for the construction of any buildings in San Francisco, but owners of property will be allowed to proceed and erect upon their premises temporary one-story buildings constructed of galvanized iron or Redwood, without a permit."

The United States Government has compiled a list of woods designating the degree of inflammability by the position on the list. Redwood heads this list.

Redwood is also peculiarly fitted for the better class of interior finishing. The natural grain of the wood is beautiful, so that it is not necessary to select special pieces in order to obtain a handsome effect. It is easily worked and takes a beautiful polish. When the wood is once properly dried, it will not shrink or swell, there-

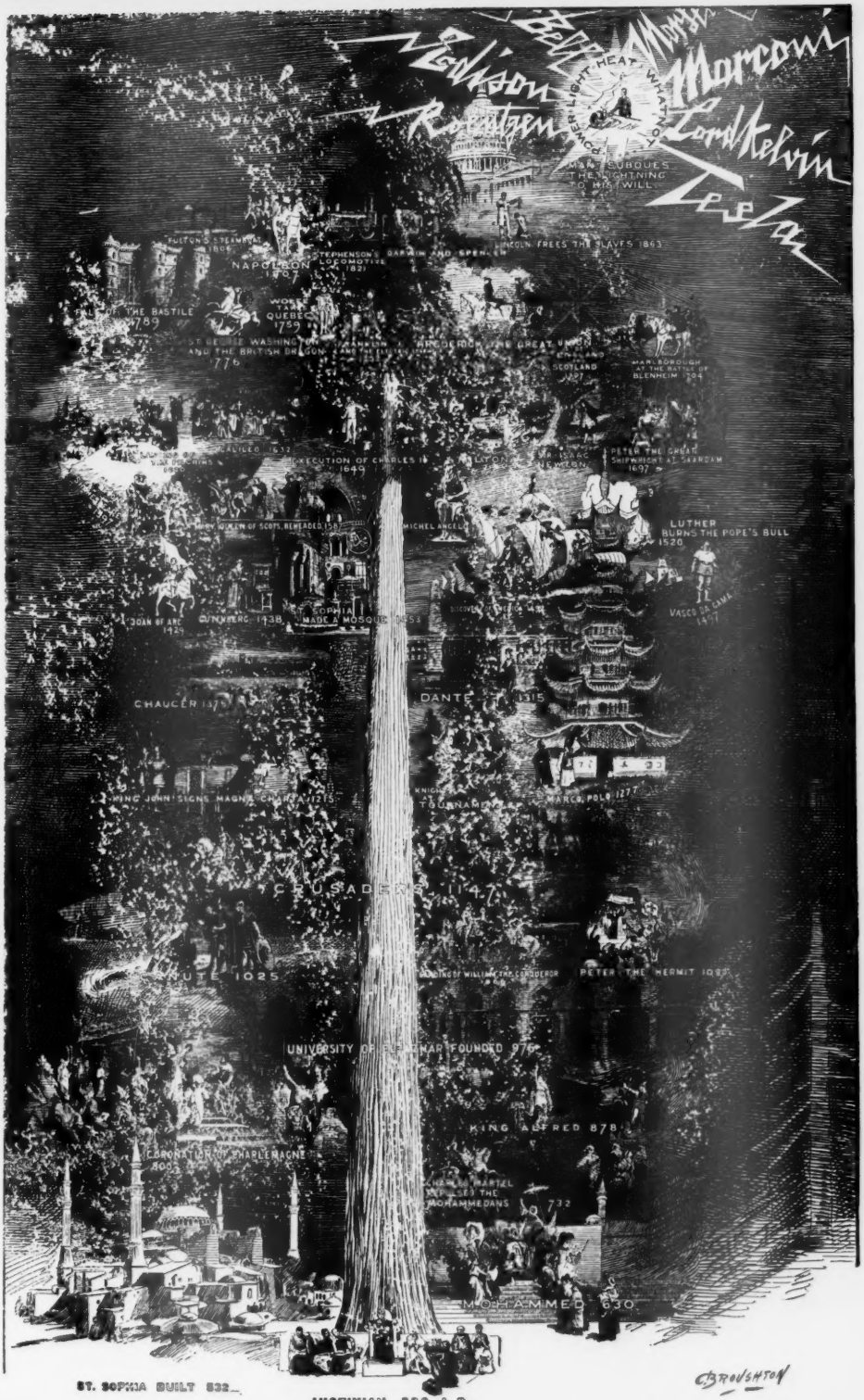
DEEP IN THE REDWOODS.

A TYPICAL SCENE AMONG THE BEAUTIFUL TREES WHERE JOURNEYING IS ALWAYS A SOURCE OF WONDER AND DELIGHT.



A Typical Redwood.

THIS SHOWS NOT ONLY THE SIZE OF THE REDWOOD BUT THE NATURE OF THE LUXURIANT UNDERGROWTH FOUND IN THE REDWOOD FORESTS.



LEADING WORLD'S HAPPENINGS DURING THE LIFE OF A REDWOOD TREE.

GOOD ROADS GIVE OPPORTUNITY FOR DRIVING THROUGH THE HEART OF THE REDWOOD FORESTS AND THOUSANDS OF TOURISTS TAKE THE TRIP.

NEAR THE SISKIYOU NATIONAL FOREST.

THE TYPE OF REDWOOD ADJACENT TO THIS NATIONAL FOREST IN CALIFORNIA. NOTE THE MAN STANDING AT THE BASE OF THE LARGEST TRUNK.

fore, there will be no unsightly cracks to fill up after a few years of use.

Redwood is used for doors, sash, columns, window frames, mouldings, porch rail and balusters, lattice; in fact, for all kinds of exterior and interior work. There are various kinds of special work for which Redwood's peculiar qualities are fitted such as incubators, beehives, pattern stock, tank, pipe and silo staves, cores for veneer work, caskets and casket boxes. In addition to the uses for the upper grades mentioned, the lower grades of Redwood are used for all kinds of foundation work, irrigation work, as well as railway ties and tunnel timbers. Redwood is not only valuable for these purposes because of its durability and freedom from decay or rot, but also because it is not susceptible to the attacks of insects, such as the white

ant that destroys other soft and hardwoods.

Notwithstanding the handicaps that have existed in connection with the marketing of Redwood in the East, the present volume of Eastern shipments is now about 75,000,000 feet annually. This stock is distributed in practically every state, except those in the extreme south, from Colorado to Maine. While Redwood is extremely heavy when it is first cut, it dries out very light so that it may be advantageously shipped East on high rates of freight in competition with other woods. The foreign market takes even greater quantities of Redwood than the Eastern market. Australia and the United Kingdom are the largest consumers of the upper grades, while the west coast of South America, India, China, the Philippine and Hawaiian Islands use quantities of Redwood ties. Smaller shipments of Redwood have been made to the east coast of South America, France, Germany and South Africa. Earlier shipments of Clear Redwood to Australia and Great Britian were largely heavy plank in the green state. Recently both of these countries have begun to realize the advantage of purchasing seasoned material in the sizes that are actually going to be used, and as many of the mills are now equipped to handle seasoned stock in large quantities, the volume of business has been considerably increased. Australia has already ordered 50,000,000 feet of Clear Redwood in 1914.

The problem of drying Redwood properly has been a serious one because of the large amount of moisture the wood contains. Earlier shipments of kiln-dried material did not give satisfaction because of the stock being dried too quickly, or too much, leaving the wood brittle and likely to split. Now the manufacturers realize that the best method of artificial drying is the one that approaches most nearly the natural air-drying, namely, a low heat with a big circulation of air to carry off the moisture.

The ability to furnish seasoned Redwood in large quantities will undoubtedly open new markets throughout the world, and with the improved conditions for marketing their products, because of the Panama Canal and the Northwestern Pacific Railroad, the Redwood manufacturers of California are looking forward to a period of prosperity that will increase by leaps and bounds as the true worth of their wood is recognized in a greater degree.

AN EFFECTIVE FORESTRY EXHIBIT

NEW JERSEY made an exhibit at the Trenton Interstate Fair which appears to have gone a long way toward presenting the aims and methods of forestry to the people, especially to the farmers, who may be interested as woodland owners.

The Trenton Fair, held annually at the end of September, usually attracts upwards of 150,000 people from all over New Jersey and eastern Pennsylvania. A very large proportion of them are farmers who seek information as well as amusement.

The forestry exhibit was established on a lot 55 feet by 100 feet surrounded by an old-fashioned post and rail fence made of blight-killed chestnut. Telling placards showed that this fence compared favorably in cost and in durability with any of the modern forms. The central feature within the enclosure was a slab cabin 20 feet by 25 feet in which were exhibited large pictures of forest operations, a collection of forestry tools, etc. Outside the cabin were displayed various local forest products, each labeled in a way to show the visitor its value as a forest product apart from its worth as merchandise. A special effort was made to label everything shown in a way to convey the sort of information that a visitor was most

A State Fair Exhibit.

THE STATE FORESTRY DEPARTMENT HEADQUARTERS AT THE NEW JERSEY STATE FAIR AT TRENTON IN SEPTEMBER.

likely to want. Other portions of the space were devoted to practical exhibits of forest planting and planting material, to demonstrations of how to doctor and care for trees, and of the damage done by forest fires.

In all parts of the exhibit stress, repeated and emphasized in various ways, was laid upon the fact that forestry of any kind depends absolutely upon the control of forest fires.

The state fire service was represented by the State Fire warden and a Division Fire warden who talked with the people constantly. The physical means of controlling fires were shown in a collection of fire-fighting apparatus.

The exhibit attracted much attention. At times the space was crowded, and the three attendants had all they could do to answer inquiries. It is estimated that not less than 15,000 people visited the exhibit during the five days that the fair continued; most of them carried away some kind of printed matter.

Forestry on King's Estate

The King of England has given permission to have a part of the royal estate placed at the disposal of the school of forestry at Cambridge University for purposes of experiment and demonstration.

Penn for Forest Conservation

William Penn, in his Charter of Rights, provided that for every five acres of forest cleared one acre should be left in woods. Foresters today maintain that on an average one-fifth of every farm should be in timber.

Rangers Posting Signs

Throughout the national forests the rangers are posting the roads with permanent guide signs which tell distances and directions, especially at forks and cross roads. The signs are usually put up in the winter when other work tends to be light. On some forests the rangers go on snowshoes, dragging loaded sleds, and nail the signboards to the roadside trees.

WOOD PULP FOR SAUSAGE CASING

SAUSAGES are now being put in casings made from wood pulp instead of the time-honored intestinal casings, and it is said these wood casings are more sanitary and more serviceable than the old style.

The description of how they are made is written for AMERICAN FORESTRY by G. P. Cohoe, chemist for the William Davies Company, of Toronto, Canada, which uses them. Mr. Cohoe writes:

This sausage casing is made of the best quality bleached sulphide wood pulp. The wood pulp is put in solution by any of the well-known methods, which have been in use for a number of years. In practice we use the well-known Viscose reaction, which has been found to be the most economical and easiest of operation. The Viscose when made is stored in containers for the proper length of time, when it is ready for the manufacture into tubes. I cannot give you any information with regard to the method of manufacturing tubes, insomuch as we have patents pending, and a further disclosure is impossible under these circumstances. The Viscose is made into thin walled tubes, which vary in diameter, according to the uses to which they are finally put. The length of these tubes vary with the skill of the operator. It is quite common in shop practice to get tubes varying from 500 to 600 feet in length. When these tubes are once made, they are reverted, and the impurities resulting from their reversion are washed out, and the result is that at the end there is produced a clear, transparent, colorless tube of pure cellulose. This cellulose is without fibre, and entirely without seam or joint, which differs from cellulose tubes made by any other manner. They are finished in a dry state, but are usually conditioned, so that the cellulose does not become hard and brittle as it dries. In this dry state the tubes are cut to suitable lengths, and prepared for the trade.

From a sanitary standpoint, this product presents several noted advantages, which are freedom from disease, cleanliness of the process of manufacture, and absolute antiseptic properties of the final product. It also presents the very valuable property of keeping indefinitely in its dry state, and not being subject to any kind of putrefaction.

From a sausage maker's standpoint, the properties which appeal to the sausage maker are the elasticity of the product, which enables it to expand when the product is filled into it by means of the ordinary filling machine. It also has the requisite strength to enable the sausage to be filled by the ordinary workman, and it is strong enough to stand the subsequent process of handling, cooking and hanging. The casing cuts, as does an ordinary casing, peeling off rather more readily from the meat than does the intestinal casing. Unlike the intestinal casing, it is of uniform diameter throughout its whole length, and thus presents to the purchaser of the sausage a better appearance than is the case with the usual casing. It is also uniform, and does not present the bundles of fibres that are common with the intestinal casing. In the past the sausage maker has had to take the sizes of sausage casing which nature presented to him. In this casing, however, it is possible to produce any size which may be desired for the various purposes of the sausage manufacturer.

Pennsylvania's Standing

According to the latest available figures, Pennsylvania stands fifth in the production of wood pulp and is second to West Virginia in the amount of slabs and other sawmill waste used for pulp; Maine stands third.

BALTIMORE'S SHADE TREES

By R. Brooke Maxwell, *City Forester*

THE first efforts made by the city of Baltimore toward the systematic planting of shade trees on the public footways were made by the Park Commissioners. The Commissioners of a decade or so ago conceived an idea that systematic tree planting should be extended to include public footways. At this time there were no ordinances authorizing the planting of trees on public footways, and it was necessary for the Park Commissioners to make a canvass of the street on which they intended to plant, and ask permission of the property owners to place trees on the footway. Several streets were planted in this manner, and because of the personal whims of the property owners the planting could not be done systematically. The plantations, therefore, in many cases presented a ragged appearance. After the trees were established the Park Department being handicapped by lack of legal support was not able to give the necessary oversight, and to carry on the cultural operations. The trees were therefore abused, some of them removed, and the work of the Park Commissioners in general was not successful.

Baltimore gradually came to realize the fact that the shade trees of the city were real city assets, the proper care of which required a technical municipal organization or department just as care

Center Parking, Mt. Royal Avenue, Baltimore.

SHOWING A PLANTING OF ORIENTAL PLANES. THESE TREES HAVE ALWAYS BEEN UNDER THE CONTROL OF THE DEPARTMENT OF PARKS.

PARKWOOD AVENUE, BALTIMORE.

THIS STREET WAS PARKED AND PLANTED BY THE DIVISION OF FORESTRY AS A PART OF IMPROVED PAVING WORK, THE PLANTING OF NORWAYS TAKING THE PLACE OF UNDESIRABLE POPLARS.

of the sewers or streets required such an organization. The Division of Forestry was therefore established as a Division of the City Engineer's Department. Supported by a broad comprehensive tree law, the city's tree problem is now under charge of an organized Division which has absolute control over all shade trees growing on public footways. The present organization of the Division consists of a Forester, Assistant Forester, Inspector of parking work, Clerk, three (3) gangs of laborers with a foreman over each. The present appropriation for tree work in the city is $7,900, an amount entirely inadequate for the proper handling of the tree problem.

The Forestry Division is called upon to do a large amount of parking work for the Annex Improvement Commission as a part of improved paving work, and it is only because of this work that the above personnel can be maintained.

When active work began in March, 1913, an inventory of conditions revealed that Baltimore was not a treeless city by any means, for it was found that 75,000 trees (estimated) were standing on the streets of the city proper and the Annex. These trees for the most part were planted by real estate developers and property owners who were poorly versed in the value of species and the technique of planting. Present conditions indicate that quickness of results and not permanency of tree values was sought for. As a consequence we find a preponderance of the quick-growing short-lived trees. Common among these are the North Carolina poplar and the Silver Maple. At least 75% of the trees are of undesirable species, most of them being improperly planted. The commonest faults in the planting are too close spacing, planting too near the curbing, and failure to protect the trees. This last fault in the planting is directly responsible for the decadent condition of possibly 25% of the mature trees. The growth of the mature trees which are now standing on the city's footways was made possible only by very favor-

CENTER PARKING, EUTAW PLACE, SOUTH OF NORTH AVENUE, BALTIMORE.

THESE TREES HAVE ALWAYS BEEN UNDER THE CONTROL OF THE DEPARTMENT OF PARKS.

STRIKING EXAMPLE OF THE NEED OF MUNICIPAL CONTROL.

A ROW OF SUGAR MAPLES ON EUTAW PLACE, BALTIMORE, KILLED BY IMPROPER "HEADING BACK." THIS WORK WAS DONE TO DISPLAY THE NEW HOUSES.

able factors of growth and not to the exercise of tree culture. When these trees were planted the streets were of cobble, the footways of brick, and surface drainage common. The introduction of new paving materials for both road-bed and footways and underground drainage makes the successful growth of shade trees on the streets possible now only through the practice of intensive arboriculture. Baltimore is characteristically a city of narrow footways and solid blocks of houses, factors which make the solution of the tree problem difficult. The conspicuous absence of front lawns or grass plots, and the increasing of cement footways and asphalt roadways adds greatly to the difficulty of growing shade trees on the footways.

The provisions of Baltimore's shade tree laws are carried out through the City Forester's office by means of the permit system using the city's patrolmen as the inspectors. This plan is not ideal, because the inspectors are versed only in the legal phase of the subject.

The classes of work carried on by the Division are the ordinary ones of planting, pruning, spraying, removing and tree repair. All work is done from a single working centre which, while somewhat remote from certain points of the city, is centrally located with respect to the "tree area." A large compost and soil heap, a "heeling in" ground, and a repair shop are valuable divisions of the working center.

ARCHITECTURE COMMON TO BALTIMORE.

NOTE THE SMALL PLANTING SPACES ON THE NARROW CEMENT FOOTWAY. THIS IS NOW PREVENTED BY THE OFFICE OF TREES, AND MUCH LARGER PLANTING SPACES ARE REQUIRED.

The present scheme of planting on the footways of the city provides for the planting of public thoroughfares (not business streets) and drives first. Such a system of planting reaches the greatest possible number of people. The placing of trees on streets other than those mentioned will have to come later unless the work is paid for by the benefited property owners. 1,795 trees of the standard street species were planted during the first year of work.

Pruning work is distributed much as the planting work is, except where dangerous or urgent conditions exist. Large numbers of the mature trees are suffering from "stag-headedness," abrasions caused by electric wires, etc. These conditions are being improved as rapidly as funds will permit. 2,500 trees were pruned during the first winter, and about 500 removed.

Baltimore is fortunate in being comparatively free from the ravages of dangerous boring insects. Infestations of the leaf eating and several scale insects are common, however. Of the former the tussock moth and the bag worm are most serious. The elm leaf beetle is found only in small numbers and is easily controlled. During the present summer the attacks of the tussock moth were unusually severe and thousands of trees were entirely defoliated. The silver maple and the American linden suffered most. The North Carolina poplar is supposed to be a harbor for the tussock moth, but experience gained during the present summer leads the writer to believe that the species is more nearly immune from the attacks of the leaf eaters than either of the lindens (European and American) or the Oriental Plane.

The oyster shell and black banded lecanium scales are the commonest of the sucking insects. The former is common on the silver maples and the latter on the planes. Every possible effort is being made with the funds at hand to control the insect situation. The plan of offering a bonus to children for the collection of moth eggs has been inaugurated and should be productive of good results.

Very little cavity work or tree repair is carried on by the Division. In general it is found that where a tree is sufficiently decadent to require the expenditure of a large sum of money for cavity repair the money is better spent in establishing several young trees.

A field of service where the Division of Forestry is of especial value to property owners is in the supervision of tree trimming work done by public service corporations. Wherever it is necessary for a company operating overhead wires to prune trees in order to keep their circuits open this work is carefully directed and supervised by the office of trees. A small source of revenue is realized from this work.

TREE SURGICAL WORK BY THE BALTIMORE FORESTRY DEPARTMENT.

THIS TREE IS STANDING AT THE PLACE WHERE CHARLES CARROLL OF CARROLLTON WAS BORN. THE PROPERTY IS NOW OWNED BY THE CITY.

A shade tree nursery is being developed by the city on a portion of its water shed area at Loch Raven, Md. 7,500 desirable street trees of various ages and sizes are now growing in this nursery.

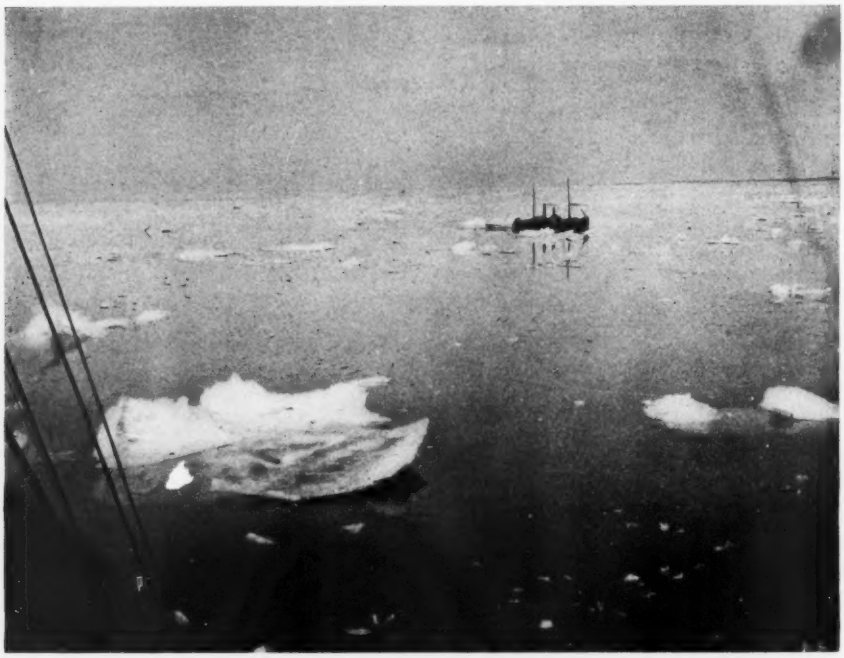
A TRIP FOR REINDEER

By ARNOLD HANSSEN

IN THE month of July I was sent by the Laurentide Co., Ltd., of Grand' Mere, Que., to bring a shipment of reindeer from Newfoundland to Quebec. By the courtesy of the Department of Marine and Fisheries of the Dominion Government we were allowed to transport the deer on one of their steamers which was making the trip to coal and provision the lighthouses and telegraph stations. The deer were purchased from the Grenfel International Association and were at their station on the peninsula between Ha Ha and Pistolet Bays on the northern coast of Newfoundland. This peninsula, swept by the winds from the north Atlantic, is mostly barren rocks, covered with the white reindeer moss, except in the low sheltered places, where there is dense small spruce, twisted by the winds.

I left Quebec late in July on the Government Steamship Montmagny, which has since been sunk by collision with a collier in almost the same manner as the ill-fated Empress of Ireland. On the fifth of August we arrived at Cape Norman about ten miles from Ha Ha Bay, when we received a message telling us that war had broken out and that as there were two German cruisers in the Gulf of St. Lawrence, we must return at once to Quebec. I was much disappointed at being so near our destination and unable to get the deer.

Fortunately a couple of days later we met the Government S. S. Mont-



DOMINION GOVERNMENT SS. "MONTMAGNY" IN AN ICE FIELD.

THIS BOAT, WHICH TRANSPORTED THE REINDEER, HAS SINCE BEEN SUNK AS THE RESULT OF A COLLISION IN ALMOST THE SAME MANNER AS THE ILL-FATED EMPRESS OF IRELAND.

THE MAIN HERD OF REINDEER.

THESE BELONG TO THE GRENFEL INTERNATIONAL ASSOCIATION AND ARE HERDED ON THE PENINSULA BETWEEN HA HA AND PISTOLET BAYS ON THE NORTHERN COAST OF NEWFOUNDLAND.

calm which was on her way to Labrador and would touch at Ha Ha Bay and I accordingly transferred to her, and about ten days later dropped anchor at Ha Ha.

We expected to find the deer in a corral all ready for us but found instead that they were somewheres in the mountains and that the herders had gone to St. Anthony, leaving no orders about our consignment. There was only one man left and as we wanted the animals at once he said he would drive them in without delay and declined the help of the fifteen sailors kindly offered by the Captain.

We waited, expecting soon to see a stately procession of reindeer marching dignified into the inclosure: we waited one hour, we waited two hours and then it commenced to rain. After four hours, when the men had all gone back to the ship, except the purser and myself, the man returned saying that the animals were quite content where they were and refused to be driven in.

We thought that as we should have to wait for the herders to come back, we might as well see something of the country and perhaps get some pictures of the deer in the open. So we started across the peninsula and then followed up the other shore and after a short time sighted three deer, their silhouettes easy to distinguish against the dull sky. As soon as they noticed us and had a good look, they seemed to think that we were worse than we appeared and cantered over the ridge more like wild caribou than domesticated reindeer. This first sight made us eager for another, so we followed them through a patch of dripping spruce which wet us to the skin, to the barren rocks where the going was easy.

For half an hour we saw no more, then suddenly came across three lying down in a small bog. When they

LASSOOING A REINDEER.
AFTER STRENUOUS WORK THE REINDEER WERE DRIVEN INTO A CORRAL WHERE THE HERDERS EASILY LASSOED THEM.

scented us they started off, but by walking slowly and well off to the sides we cut them off and got them started toward the corral. A little later we saw fifteen more, somewhat to one side, but by making a detour we had no difficulty in getting them to join the first three. With the increase in numbers the deer went along more quietly and confidently, but we had to sprint now and then to keep a certain doe where we wanted her but where she did not want to stay. She appeared to be quite a leader, which seemed funny to us as we thought the bucks always played this rôle, but perhaps the suffragette movement has begun to reach the animal kingdom also.

As long as we could steer that doe towards the corral, we did not need to give much attention to the others, who followed her everywhere, but she certainly kept us busy at times. Rounding a corner of a cliff, we came upon the main body of the herd, about 400 deer, feeding around a small pond in the rocks. They started to grunt when they saw us, but showed no signs of fear, so we had a pretty easy task driving them towards the landing place, close to which we met the herders, who had just returned, and where we also had the aid of the sailors from the ship.

The great number of men seemed to make the deer uneasy, and they tried to break away, but we had them pretty well cornered and after half an hour's running at top speed to keep them together, got about two hundred inside the corral where the herders started to lasso those picked for shipping. The lassoing itself was easy compared with the handling of the captured deer, who fought with front and hind legs, as long as they had a foot free. This made it necessary to tie their feet up. We tried the crate cases but without success.

On board the ship they were put into pens 15 x 15 feet, 6 deer in each, and although we had rough weather for several days, with the sea washing over

PUTTING REINDEER ON BOARD THE BOATS.

SO VIGOROUSLY DID THE REINDEER FIGHT THAT IT WAS NECESSARY TO TIE THEIR LEGS TOGETHER AND THUS RENDERED HELPLESS THEY WERE CARRIED ON BOARD.

REINDEER IN THE CORRAL OF THE LAURENTIDE COMPANY.

THEY WILL BE SOON TRAINED TO HARNESS AND USED FOR SLED WORK AT SOME OF THE COMPANY'S WINTER PLANTS.

the steamer, they did not suffer at all, but arrived in Quebec after a ten days' voyage in fine condition. They were taken out of the steamer's hold in crates about eight feet long by four feet wide by five feet high, four to a crate, and driven to the railway where they were placed loose in a box car, and arrived at their destination in good shape. There they were placed in inclosed pieces of woodland where there is plenty of browse and some pasture and are now fat and sleek. They are just commencing to lose the velvet from their horns, and as soon as the rut is over the training to harness will commence. They will be used for sled work at some of the lumber camps of the company.

FENCE OFF WOODLOTS

THE importance of fencing off from cattle a woodlot on each farm now being cleared in northern Wisconsin has been emphasized recently by representatives both of the Wisconsin State Forester's office and of the United States Forest Service. F. G. Wilson, of the State service at Madison, accompanied by Benton Mackaye, a member of the National Forest Service at Washington, have been examining the woodland in that vicinity of northern Wisconsin.

"The one essential need in preserving the woodland in this country," said Mr. Wilson, "is to have a woodlot, free from cattle, of ten or twenty acres on each farm. No farm is complete without a woodlot. Every good farmer, of course, knows this. It is needed, not only for firewood and building material, but also for the yield in dollars and cents which it will bring. The pioneers of northern Wisconsin are people who look ahead. They are right now building homes, not alone for themselves, but for their children. The wood crop is slow, but it is sure; and, unlike other crops, it needs very little cultivation.

But there is one thing that the woodlot needs right off, and that is a fence around it. A permanent woodlot needs young trees growing up quite as much as growing stock needs feed. I understand perfectly well that cattle need tree shade. Let them have it. But they don't need all the shade there is. Don't fence off all your woodland; fence off ten acres on every forty and let the cattle run through the rest of it. There should be enough trees left in the pasture to shade the cattle just as there should be enough trees left around the house to shade the folks. And in addition to these trees, there should be a woodlot, where there is *'no trespassing'* for cattle.

"A woodlot of about 20 acres on each 80-acre farm will add many dollars in value to that farm in future years.

"The pioneer seems to have one main idea in mind—to clear the land. He forgets to leave the very thing that later he will work hard to get back. Here is where the pioneer has his chance over the established farmer. If he would only concentrate his clearing on four-fifths of his farm—clear that well and simply protect the rest as a woodlot—he would then be making a complete home and outfit for his family instead of an incomplete one."

Wood for Handles

As many as 72 different kinds of wood are used in the manufacture of umbrella handles, canes and whips in this country.

Cinders Carried Twenty Miles

Authentic records show that cinders, from a forest fire in the tree tops in northern Washington this fall, were carried a distance of twenty miles.

THE EARLY LOGGER IN THE SIERRAS

By ALEXANDER W. DODGE, *Deputy State Forester of California*

DURING the winter months, when, in Maine, the lumberjack is straining his peavy and cross-hauling the logs onto his bobsleds, his brother, the western logger, is not so fortunate. The latter will doubtless be found, together with many others like him, either ornamenting the entrance to some city employment agency discussing at length and to no purpose the great issues of the day or "goin' south" on the first "safe catch" that leaves the railroad yards. The man of the logging camps in the California Sierras is, perhaps of necescity, a transient. He is often a traveler whose destination is anywhere and nowhere in particular; whose ticket is apt to be both invalid and unlimited; at whose station no one awaits him unless it be a "cop"; whose meals are delicious, irregular and hard to get; and whose baggage consists of no more than one man can carry. The majority of these men who follow logging operations would gladly remain in the woods permanently, since every day adds, on an average, two dollars to each individual "stake."

However, not long after the beginning of November the first snow lightly covers the forest and the mornings are likely to be sullen and grey. The tent flies strain slightly under the gentle weight of the powdery herald of winter and immediately there is talk of closing

A LOGGING TRAIN.

LOGGING THROUGHOUT THE SUMMER MUST BEAR ITS SHARE OF THE EXPENSE OF PREPARATORY WORK IN THE SPRING.

THE LOG POND.

LATE IN THE SEASON SPECIAL ATTENTION IS GIVEN TO FILLING THE LOG POND AT THE MILL TO PROVIDE FOR A BUSY WINTER'S WORK.

the camps. Just before this time the mill cut is materially reduced and special attention is given to filling the log pond. So, when the shrill whistle of the donkey engine in the woods toots its last "pull-her-in" signal, the log pond is generally full and logs are decked high on the banks. This supply of logs will enable the mill to begin cutting before the woods are opened up the following Spring. The camps close down and outgoing trains are loaded with men bound for town. To almost every man will come a new suit, a hat and new pair of shoes, a week of bright lights and player-pianos, a good time and then, unfortunately, to many of them, a long winter of existence by this means or that.

Soon after the closing of the camps the mill shuts down and the jackladder chain gets rusty again. The Sierras are silent during these months—usually from the first of December to the latter part of March—silent and deserted save for the lone trapper or prospector who decides to breast the heavy mountain storms. In his solitary fight against the cold he takes pleasure in counting the days until the time when his departed friends, the lumbermen, will return; to the time when the camps will open again and the scent of logging will fill the summer air; to the days when credit will be given at the camp commissary; and to the clear summer nights when the gang around the campfire will listen intently to his tales of the winter's adventures.

Some winters in California are less severe than others; but, it is not safe to count upon a light annual snowfall until Spring actually comes. Heavy snow storms occur in the Sierras and well below the timber-line, not infrequently, as late as the middle of April. Spring comes and clear weather enables the farmers in the valleys to cultivate the soil and plant their early crops; but, the lumbermen in the Sierras still wait for the deep snow to disappear. In some sections the lumberman is indeed fortunate who is able to resume operations by the middle of March. The nature of methods employed in western logging render early operations difficult. Power logging requires the manipulation of extremely heavy machinery and

THE FIRST CREW BREAKING THE TRAIL TO THE CAMPS.

THE WRECK OF THE COOK HOUSE.

TIRED OF ITS WINTER BURDEN THE COOK HOUSE GAVE WAY UNDER THE WEIGHT OF SNOW ON ITS ROOF AND HAD TO BE RECONSTRUCTED.

this cannot be successfully accomplished when there is a material depth of snow on the ground.

A large company operates a mill of 250,000 feet daily output at Stirling City, in the Sierras of Butte County. This company, not unlike several others in the State, depends upon the operation of many miles of logging railroad; it maintains about sixty miles of such roads leading further into the mountains from Stirling City. The construction and maintenance of a logging railroad through mountainous country are immense items of expense and tend to increase the cost of logging, perhaps, to a maximum.

THEY COULD HEAR THE THUD OF THE GREAT PINE AND THE SING OF THE BUCKER'S SAW.

During the early Spring of 1913 it was my opportunity to become familiar with the difficulties encountered when an attempt is made to "begin early" in a Sierra logging camp. Seven camps supplied the Stirling City mill with logs and all these camps were buried in snow and at a great distance from the mill. The winter had been severe and heavy snow storms continued until about the first of April. Clear weather in the valleys below prior to this date had turned the toes of many a waiting lumberjack toward the hills. In their hearts they could hear the thud of the great pines, the sing of the bucker's saw, the familiar shrill whistle from the donkey engines, the triangle gong which rings to the beat of the "chink's" flunky; and the vision of a table loaded with real things to eat came before them—all this recollection awakened a longing to return, and the man without a job came back.

On April first there were several hundred idle men on the sidewalks of the little lumber town of Stirling City. Credit was given practically everywhere in town and the men were comfortable. But still there was nothing for them to do. On the third a few of the men were detailed to shoveling snow and the first real work was begun. Attention was immediately directed toward excavating the roundhouse which was buried in from eight to ten feet of snow. This accomplished, the little narrow-gauge locomotives were pressed into service. With a steel nose to act as a snow-plow, arranged in front, the "One Spot" started the strenuous work of "breaking through"; work that continued for several weeks.

The average depth of snow on the tracks was five feet; although, in many places, the "One Spot" backed up three hundred yards or so and, at full speed ahead, rammed into nine feet of level

snow. The sight is one that comparatively few have seen. Through the average depth of snow the engine would force its way about twenty feet and then stick, unable to move in either direction. Each time she would have to be dug out until the drive wheels were free to move again. To assist in pulling the engine free the "Two Spot" coupled on each time from behind. Backing up again, the same performance was repeated and the work continued for days and weeks until miles of road had been opened at an average cost of $225.00 per mile. This work merely rendered the forest accessible, while the task yet remained of excavating the camps and reconstructing buildings whose strength had succumbed to the extreme weight of the snow. Upon abandoning camps before the winter, all water pipes had been drained; consequently, the problem of immediate water supply was simple although the pipes lay buried deep in the snow.

Four weeks of preparatory work being completed, the first train of logs finally left for the mill; but, some of them never reached their intended destination. At Kaiser Creek the rails lead onto a high curved trestle over a rushing mountain stream. As the cars ran onto the bridge, even slowly, the inside batter-post of one of the bents sagged under the old and familiar yet new and unaccustomed weight. The bridge inspecting crew had failed to detect what the winter had done to this particular mudsill and, as the result, the cars leaned, gently at first, inward; there was a spurt of steam from the "Five Spot" as her driver applied the brakes, a straining of log chains, a shout from the "brakey" as he jumped to avoid the fall; and five cars of logs crashed down into the canyon below. Several such accidents occurred, and not without the loss of a few lives, before the road was entirely reliable.

Logging throughout the summer must bear its share of this preparatory expense; and the cost of logging thus necessarily raised results, usually, in an increase in the selling price of lumber produced.

DOWN GRADE WITH A HEAVY LOAD OF LUMBER.

Wireless for Fighting Fires

Wireless telegraphy is being used in Canada in reporting on forest fires.

PRIVATE REFORESTATION

By M. H. Hoover

DESPITE the activities of the State of New York to encourage the reforestation of waste and denuded lands by offering suitable trees at cost to private owners and by the enactment of more equitable taxation laws, the replacing of forest trees on lands now producing little or no valuable growth is generally not making the progress which the situation demands. The owners of denuded forest lands are usually ready to admit that the reforestation of their property would prove a splendid investment, but too many lack either the initiative or the capital to act on their convictions in this regard.

As for the State, the legislature has been backward in making appropriations necessary to the reforestation of its own forest preserve lands at a rate commensurate with the requirements of a vast area comprising about 1,600,000 acres, about one-third of which should be immediately replanted.

Of the State's 30,498,560 acres, total area, 12,000,000 acres or 40 per cent. are wooded. But only half of the wooded now contains merchantable timber, with 3,500,000 acres now ready for cutting in the Great Forest Regions and 2,500,000 acres in the farm woodlots. There are 4,500,000 acres with more or less valuable growth, but not now merchantable; and 1,500,000 acres with no valuable growth. There are 800,000 acres of unimproved farm lands which are best adapted to forest growth. In the State today we have 2,300,000 acres producing no valuable growth, a virtual waste of about eight per cent. of the State's total area, and almost three times the area occupied by the towns, cities and roads of the State. The College of Forestry at Syracuse in a recent bulletin declared that about one-half of the state's area could be best utilized in growing forest trees. That estimate seems to be much too high, in view of the fact that New York has 16 counties which the Federal census calls banner agricultural counties, and, in view of the value of the farm products of the Empire State. The Conservation Commission's estimate of one-eighth of the state's area being wasted, because not reforested, may be low. At any rate, the fact remains that both public and private land owners have an immense task, as well as duty, to perform.

Governor Glynn, not long ago, in an address to conservationists, inclined to the view that the state would have to adopt a more radical programme in order to effect the reforestation of the vast areas in New York which are idle. He believed that the forest lands taxation laws should be made still more liberal than they are; that the state should furnish trees at cost to private owners either in large or small lots; and that the state should itself undertake the reforestation of its lands at a rate that would replant its holdings within a few years; and that the state should itself replant privately owned forest lands, awaiting reimbursement until the tree crop should be finally harvested.

The forest products of New York State have shown a steady falling off, averaging a decrease of 25 per cent. during the years 1910, 1909 and 1908. In the last named year, the forest products of New York amounted to 1,226,754,000 feet. Last year they were a little over 900,000,000. We can no longer speak of New York's forest products output in figures of billions.

To restore the forests, for the protection of water sheds, for the needs of forest products, for the suitable habitats of fish and game, Governor Glynn's radical or progressive programme of conservation may have to be adopted. It undoubtedly would prove to be the best thing that could happen for the state of New York, from the standpoint of the lumbermen, the sportsmen and the lovers of nature.

SCOTCH PINE PLANTED FOUR YEARS.

PART OF THE WORK OF RESTORING THE CONIFER FORESTS ON THE LANDS IN NEW YORK STATE NOW OWNED BY THE BROOKLYN COOPERAGE COMPANY.

It is gratifying to observe the reforestation activities of some of the large owners of forest lands, notably those of the Brooklyn Cooperage Company. This enterprising corporation has large holdings in the Adirondacks, as follows: 18,000 acres in the Vilas Tract; 21,000 acres in the Everton Tract; 1,900 acres in the Pierrepont Lands and 7,500 acres in the Blake Lands. All the hardwood timber remains on these lands, except what was cut off after the fire of 1903. Very little of the timber was burned in the fire of 1903, and the fire due last year was avoided, by reason of the state's effective patrol system and the watchfulness of the Brooklyn Cooperage Company's own caretakers.

An inspection of the reforestation operations and their results on the Vilas Tract of the Brooklyn Cooperage Company gave most gratifying evidence of what private enterprise along these lines can accomplish. The burned areas are being rapidly turned into young evergreen forests, and where there were dark scars of the fires ravages seemingly but the other day, the delighted eye is greeted with a thing of beauty that promises to be a joy forever. Under the new order of lumbering operations, recreated forests will not be blotted out, but will be harvested in a manner which shall insure always the presence of growing trees in a given forest area.

But, now as to the practical work of restoring the conifer forests which once flourished on the lands now owned by the Brooklyn Cooperage Company. These are the splendid results accomplished on the Vilas Tract under the direction of Mr. R. M. Parker, president of the Brooklyn Cooperage Company:

Summary of trees planted in open forests:

1910—50,787 mixed, mostly red and bull pine, 3-year transplants from the New York State Nursery.

A REPLANTED HILLSIDE.

THIS IS ON THE VILAS TRACT OF THE BROOKLYN COOPERAGE COMPANY IN THE ADIRONDACKS.

1911—42,000 white pine, 3-year old transplants from the New York State Nursery.

1912—100,000 white pine, 3-year old transplants from the New York State Nursery.

1913—59,700 white pine, 2-year old transplants from the Brooklyn Cooperage Company Seed Beds.

1914—60,500 white pine, 3-year old transplants from the Brooklyn Cooperage Company Seed Beds.

These plantations, inspected by visitors in August showed on the average a vigorous growth. Owing to the burned over character of the replanted land, replanting was necessarily accomplished under difficulties. The work, however, must have been thoroughly done, as shown by the condition and progress of the young trees. The trees were planted at the rate of from 1,000 to 1,200 per acre. They stand on cut over or burned lands, with slight forest cover. Mr. Parker states that the trees of 1910 were poor in quality, but notwithstanding this handicap, the soil and environment in general about discounted it, and the young trees, especially the red pine, have done very well. Some of the most favored specimens measured 7 feet, and the average is 6 feet. Owing to abundant rains, the growth this year was remarkably rapid. Apparently, the loss of trees in the 1910 planting was not much more than 5 per cent. The inspection showed that some red spruce planted in 1910 have done exceedingly well.

Owners of private forest lands in need of reforestation will be interested in President Parker's table of the cost of replanting. As already stated, the replanting was done on burned over lands requiring more or less clearing in order to set the trees, conditions making the cost about the maximum, yet the Brooklyn Cooperage Company is convinced that it has made an excellent investment in this work.

1910, $18 per acre; 1911, $25 per acre; 1912, $16.50 per acre; 1913, $17.25 per acre; 1914, $13.15 per acre. Like every other industry, reforestation has to be learned. Moreover, a farmer raising cabbage or celery, does not buy his plants, if he has employees on the place who can put in their time growing them on his own soil. So the people of the Brooklyn Cooperage Company, with experience, learned how to do the best tree planting at the least expense, and President Parker established his own tree nursery.

NURSERY ON THE VILAS TRACT.

HERE THE BROOKLYN COOPERAGE COMPANY GETS A LARGE PORTION OF ITS SUPPLY OF SEEDLINGS FOR REPLANTING ITS LANDS. IT ALSO PURCHASES SOME FROM THE STATE NURSERIES.

Although, of course on a much smaller scale, the Brooklyn Cooperage Company Nursery at Balsam Camp, near the Five Mile Dam, West Branch, St. Regis River, St. Lawrence County, compares very favorably with the best nursery owned and operated by New York State. John A. Fraser, the Company's woods superintendent of St. Regis Falls, took charge of the work of establishing the seed beds and nursery in 1911. Mr. Fraser is a practical lumberman and woodsman, and he has satisfactorily demonstrated that he is also a practical forester and forest tree nurseryman. Under his direction, Wilber Wilson, caretaker of Balsam Camp for the Brooklyn Cooperage Company, has looked after the seed beds and nurseries, and they have prospered under his hand. The accompanying photographs show portions of the Balsam Camp nurseries, and some of the reforested lands of the company in the vicinity of the camp.

In 1911, the company set out 56 seed boxes of the usual size, sowing 10 pounds of seeds, which produced 142,000 seedlings. Two years later, 82,000 of these seedlings were taken out of the seed boxes and transferred to the nursery, while 59,700 were committed to the care of the parent forest. In 1914, three-year old seedlings to the number of 60,500 were also planted in the forest, leaving 21,000 four-year olds for planting next spring. This year they planted 20 pounds of new seed and 10 pounds of old seed, and estimate from them about 100,000 seedlings. The seedlings of 1913 will be set in the nursery in 1915, and those of 1914, in 1916. Possibly some of the two-year old seedlings may be taken direct to the forest in 1916.

In addition to their own nursery production, the Brooklyn Cooperage Company has ordered from the Conservation Commission 50,000 three-year old Norway Spruce transplants to be planted with four-year old seedlings of 1911 and two-year old seedlings of 1913 next spring.

It is interesting to know that Superintendent Fraser finds that trees planted from the beds in the open seem to fare much better than those put in the plantation, as it appears that in the plantation of 59,700 trees in 1913 there is a loss of about 2% and of the 82,000

PLANTED IN MAY, 1911.

SHOWING THE TYPE OF COUNTRY IN WHICH THIS PLANTING HAS BEEN DONE AND THE VERY NOTICEABLE GROWTH.

put in the nursery the same year the loss was far greater.

President Parker believes that the estimate of seedlings in the seed beds this year may be increased, because from the seed that was sown during the spring of 1914, seedlings are still appearing.

When complimented upon the success of his reforestation operations on Vilas Tract, President Parker said:

"The purpose of our plantation is with the spirit of the conservation of our lands. We have found no practical way of applying scientific rules of forestry to the hardwood forests in the Adirondacks, on account of the immense quantity of defective trees. Our cuttings are limited to 12 inches at the stump, and of course, we can only use in our lumber operations trees that are entirely sound, or do not show defects to a percentage large enough to make cost of cutting and logging timber unprofitable. This results in leaving on the lands almost as many trees, 12 inches and up, as we cut. These trees are defective, being either cross-grained, showing rotten limbs, having immense knurls and knots on them, or other similar defects, which condemn the wood in the tree for merchantable cooperage stock. It is a pity this is so, but the hardwood growths of the Adirondacks on account of soil, consisting either of sand or of rotten wood, with practically no dirt, makes it impossible to grow a continuous hardwood forest of high grade. Realizing this, and knowing we shall hold our land for a great many years, we have thought it wise to plant such character of growth, as will in time, yield a profitable crop, and of course, white pine is the most valuable tree for this purpose."

Wood for Excelsior

The best excelsior is made from basswood, or linden. Aspen and cottonwood, however, supply nearly half of the total amount manufactured.

THE CANADIAN DEPARTMENT

By ELLWOOD WILSON

THE Director of The Dominion Forestry Branch reports that the reindeer herd imported from Labrador did not reach Fort Smith, Alberta, in the fall of 1911 but wintered about ninety miles south near Fort Chipewyan. There was plenty of feed and they wintered satisfactorily and were in good condition when the spring opened at which time they numbered thirty-two. One strayed away in April. There was no natural increase. In May the herd were moved by scows to Whitefish Lake where they arrived without mishap. Here an inclosure of about two square miles of a promontory was built, as it was feared that the herd might stampede when the flies became troublesome. In June the bull dog flies appeared and the deer stampeded and broke through all barriers and only twelve, all does, were recaptured. One more escaped in another stampede in November. They have now all been transferred to an island about six miles from shore with an area of about six square miles and it is hoped that they will thrive there. The Dominion herd of wood bison were also examined and several individuals were sighted and tracks of larger numbers seen, but the animals are very wild. The herd is estimated to contain between two and three hundred. The wolves do not seem to have made any serious depredations on the herd.

The new beaters for the Dominion Forests Products Laboratory have arrived and very important tests and studies will be made as soon as they are installed. No large scale experiments of paper beating have ever been scientifically made and much important information is looked for from these tests.

The English Government has sent out a Commission to investigate the possibility of Canada supplying much of the timber now imported from Europe, especially mine props. The Provincial Governments have removed the restriction that all wood cut on Crown Lands must be manufactured in Canada so far as these latter are concerned, in order to help the Mother Country.

The newly located goldfields at Beaver Lake, north of Cumberland House, Saskatchewan, are attracting considerable attention and the influx of prospectors is keeping the fire rangers in that district very busy.

Mr. P. Z. Caverhill, District Forester of the British Columbia Forest Service, Kamloops, B. C., reports that he has built 122 miles of trail and sixty miles of telephone line this season. He also says, "A start was made in the disposal of logging slash. The debris after a

couple of operations was burned broadcast last spring. On tie permits the brush was piled but has not yet been burned. An interesting sequence is the keen interest taken by the settlers in brush disposal and they are now requiring almost all operators on their lands to pile the brush. This will be a great help in the future fire situation."

Professor Adam Shortt, commissioner for the Civil Service Commission of Canada, has just returned from an investigating trip to England where he made a careful study of the English system. He reports civil service quite practical and it is to be hoped that the Dominion Government will now extend it to the outside service of the Forestry Branch. The Dominion Governments might with benefit study this report.

This season sees thirty-one students in the undergraduate classes at the Laval Forest school in Quebec. Of the 27 graduates all are employed. Eighteen are in the employ of the Province of Quebec and nine are with other Governments or in private companies. It is proposed to have an advisory committee of three members of the Quebec Limit Holder's Association to help direct the energies of the school.

The death of Dr. William Saunders, C. M. G., LL. D., F. R. S. C., for 25 years Director of Dominion Experimental Farms, will be a great loss to Canada. He was founder and President for several years of the Ontario Entomological Society and for thirteen years edited the *Canadian Entomologist*. Under him the Government established five experimental farms. His work in cereal development and in the improvement of plums and other native fruits of western Canada was of great value, and to these farms the success of wheat growing in the west was in large measure due. The arboretum and forest belts at the Central Experimental Farm, Ottawa, the plantations at Brandon, Manitoba, and Indian Head, Saskatchewan, have been a source of inspiration and information in farm forestry and the western plantings were the forerunners of the system of free distribution of trees to farmers for planting around their homesteads, which has now grown to such immense proportions under the Dominion Forestry Branch.

Mr. J. B. White, Woods Manager for the Riordan Pulp and Paper Company, has been appointed a member of the Forestry Committee of the American National Wholesale Lumber Dealers Association.

Mr. Ellwood Wilson, Forester for the Laurentide Co., Ltd., has been appointed a member of the Standing Committee on Forest Protection of the American Forestry Association.

One of the forestry projects upon which the Commission of Conservation is engaged is a survey of the forest resources of British Columbia. This work was started last year and it is hoped that a fairly definite idea of the forest resources of the province will have been secured by the end of next year. For this work, the Commission has secured the services of Dr. H. N. Whitford, formerly of the Philippine Forest Service, and of R. D. Craig, for some years with the Dominion Forestry Branch, and later engaged in private forestry work in British Columbia. The plan of work is to collect, check and compile all available information. A large percentage of the accessible merchantable timber of the province is held under timber limits, and for most of these limits, one or more cruises have been made. The limit holders are cooperating generously with the Commission by furnishing information relative to the amount of timber on the individual limits. In addition a large amount of detailed information has been secured through forest surveys conducted by the Provincial Forest Branch, and by the Forestry Branch of the Canadian Pacific Railway. All this information is being used by Messrs. Whitford and Craig, and is supplemented by information collected at first hand, as well as by data secured from timber cruisers, surveyors, explorers and others. Previous estimates indicate that there is something like 300 billion feet of saw

timber in British Columbia, which is supposed to be approximately one-half the amount of merchantable standing timber in Canada. This is only one-fourth to one-fifth as much as the estimated forest resources of the United States. In addition to the amount of saw timber, there is a vast quantity of pulp wood of which no reliable estimates have been made. Fires have uselessly destroyed many times the amount of timber now left standing in Canada.

The Fire Protection Work of the Dominion Railway Commission has now been organized for nearly three years, and has shown excellent results. From being the greatest single source of fire damage, the railways now give promise of dropping well down in the list of minor agencies. They have also accomplished a great deal in the way of reporting and extinguishing fires not due to railway causes. The Board's order gives the Chief Fire Inspector very wide discretionary authority in determining what specific measures are necessary for the proper prevention and control of fires along railway lines. This is particularly the case with regard to special fire patrols in forest sections and the construction of fire guards in the prairies. The Order also requires the use of efficient fire protective appliances on locomotives, prohibits the use of lignite coal, requires the issuance of instructions covering the reporting and extinguishing of fires by railway employees, and gives the Fire Inspection Department power to regulate the burning of inflammable debris along the right of way. The Railway Act requires railway companies to maintain their rights of way free from dead or dry grass, weeds and other unnecessary combustible matter. In carrying out the above requirements, the Fire Inspection Department of the Board cooperates closely with the fire protective organizations of the Dominion and provincial governments. Under the plan of cooperation now in effect, more than seventy officials of these fire protective organizations have been appointed officers of the Fire Inspection Department of the Board, for the purpose of maintaining a constant supervision over the work of the railway companies, to insure that the necessary measures shall be taken for the prevention and control of railway fires. Practically all the railways have shown great improvement in fire protection work. The Canadian Pacific and Canadian Northern Railways have organized especially for the handling of fire protection work, as a partial result of the Board's requirements.

Mr. R. H. Campbell, Director of the Dominion Forestry Branch, returned in September from his European trip. During the visit he attended the fiftieth annual meeting of the Royal Scottish Arboricultural Society, and was made an honorary member of the Society. An extensive tour was intended but the war suddenly prevented it while Mr. Campbell was in Geneva. Here he was detained for a week before securing transportation out of Switzerland through Paris to England.

The field reconnaissance work of the Dominion Forestry Branch progressed considerably during the past season. With eleven parties in the field, the division of agricultural and forest lands through the West was extended considerably. The surveys this year were distributed throughout Eastern Manitoba, Northern Saskatchewan and Alberta, Eastern Slope of the Rocky Mountains and Railway Belt of British Columbia. As a result, a continuous belt on the northern boundary of the prairies through Manitoba, Saskatchewan and Alberta about 100 miles wide and linking up with the timber slopes of the Rockies has been reported on to date. North of this belt lies an extensive area which is mostly forest land, but contains some good agricultural areas. Explorations have shown that the forest north of the prairies may be classed as two types, muskeg and ridge, the latter of which is characterized by Jack pine, spruce, and poplar. There are some areas of good agricultural land in this region which are mostly covered with small poplar.

The expense of the fire season in 1914 has been the heaviest in the history of the Forestry Branch. Owing to

a particularly dry period in August, ten bad fires occurred on the east slope of the Rocky Mountains, the largest burning 125 square miles before it was controlled. Fires in the Railway Belt of British Columbia were more numerous still, but did not burn over extensive areas.

FORESTRY AT THE EXPOSITION

THE forestry and forest products exhibit at the Panama-Pacific International Exposition will be shown in the Palace of Agriculture, which with the exception of the great Palace of Machinery, is the largest exhibit palace of the exposition. The Palace of Agriculture covers an area of 328,633 square feet and was erected at a cost of $425,610.

Group 134, under the official classification of exhibits, is divided into four classes of forestry exhibits comprising forest geography, maps, statistics and general literature, geographical distribution, botanical collections, seeds, bark, foliage, flowers, fruit, bark and wood sections. The planting, equipment and processes for tree collection, nursery practice, field planting and field sowing, make up class 661. Management and utilization, equipment and processes for protection from fire, insects and disease, organization of protective forces, ranger stations, trail and telephone systems, logging methods and equipment, transportation of logs and systems of cutting, comprise another.

The indirect use of forests, such as watershed protection, effects on climate and public health, prevention of erosion and shifting sand, use of windbreaks for recreation or as a refuge for game, is all considered in a separate class.

Forest products are exemplified in three classes: lumber, equipment and processes used in cutting lumber-logs into lumber, drying, dressing and grading of lumber and the rules for grading; saw-mill and planing-mill products for the manufacture of lumber; wagon-stock, cooperage, boxes, pickets, shingles, and doors. Veneering and veneering-cutting machinery will also be shown. Forest by-products—tan-bark and extracts, naval stores, oils and distillates, charcoal, cork, dye-woods, medicinal and textile barks. Kiln-dried wood, wood fuels and wood will occupy another class.

A Forester's Directory

The American Forestry Association wishes to compile and to keep up to date, a directory of foresters, in the United States, its possessions, Canada and Mexico.

This will be of considerable benefit to the members of the profession, as the Association is frequently asked for information concerning the whereabouts of foresters, and is also often asked to recommend foresters for various positions.

The American Forestry Association therefore requests each forester, whether he is a member of the Association or not, to send his full name, address, name of school or schools of which he is a graduate, and the feature, if any particular one, of his profession, in which he specializes.

This directory will be kept up to date from year to year, and will be available for any inquirers at any time.

Foresters are requested to note, in the advertising section of AMERICAN FORESTRY magazine, a free advertising section for foresters wishing positions or for those wishing to employ foresters.

EDITORIAL

LUMBERMEN are daily learning of opportunities to export timber to Europe to take the place of the supply formerly obtained from European countries and which has now been cut off by the war. An instance of this is England's demand for mine props. Formerly most of these were obtained from the Baltic provinces and from France. Now England is looking to Canada and the United States to supply them. A Commission has been appointed to visit Canada to investigate the possibility of that country supplying most of the timber England now needs. The Provincial governments have removed the restriction that all wood cut on Crown Lands must be manufactured in Canada, as far as mine props are concerned, so that they may be shipped in the rough.

Commenting on the need of England for mine props H. O. Williamson, an engineer of the Consolidation Coal Co., of Fairmont, West Va., writes AMERICAN FORESTRY Magazine:

"It is interesting to note that the English mine operators report a prop cost running as high as thirty-six cents. While there are a number of other factors, in addition to the availability of timber, entering into the subject of cost, still, even considering these, it is rather startling to compare this maximum of thirty-six cents with, say, our present maximum of possibly six cents."

The timber export question is further illuminated by a dispatch from London on Oct. 27, stating that German cruisers had seized four Swedish ships laden with lumber for England, and that Germany has declared it will consider all shipments of timber to Great Britain as contraband. The effect of this should be to increase the opportunities for American shippers.

WEST VIRGINIA is another State which desires an up-to-date forestry law, a State forester, and a well managed state forestry department. Wide-awake men of the State are lending their aid to the movement to secure such a forestry law and it is gratifying to note that almost every timberland owner and lumberman in the State is interested. Members of the legislature have already pledged themselves to give earnest consideration to the proposed bill and the State Chamber of Commerce has passed resolutions calling attention to the value of the timber lands of the State, the need for their proper protection and to the benefit that will be derived by the entire State if such a forest law as is required is passed by the next legislature.

The arousing of popular demand for a State forestry department and a liberal appropriation for conducting it is now under way, all that is necessary to inspire such a demand being the ability to let the people know of the benefits which will accrue to them individually and to the State at large by the passage of a forestry law.

BALTIMORE'S experience with her street shade trees should be a warning to other cities throughout the country, many, aye most, of which have followed the same lack of system and carelessness in planting of trees.

A year ago Baltimore awakened to the need of a city forester. It was then found that of the 75,000 trees in the city's streets almost 60,000 were of undesirable species and that most of the trees had been improperly planted. This fault has resulted in some 20,000 of the mature trees being in a decadent condition.

Although the city forester has been at work only eighteen months and is handicapped by an inadequate appropriation, great improvement is apparent. The situation is described in an article in this issue.

City officials are urged by the American Forestry Association to give more thought to shade tree conditions in the municipalities of which they are in charge. They will find that in practically every case the trees are being neglected, that most of them are improperly nourished, that species unfitted for climatic or street paving conditions have been planted; and that considerable damage, particularly in the smaller cities and towns, is being done by telephone, telegraph and electric light wires.

The value of beautiful shade trees and well-shaded streets is not properly appreciated. It should be apparent that well-shaded streets attract residents and thus maintain or increase real estate values and that no community ever loses by attention being paid to beautifying and improving it.

IT IS hoped that by the time this is read, Minnesota will have carried an amendment to the State constitution, providing for the establishment of State forests on State lands which are unfitted for agriculture. The voters of the State cast their ballots for or against this measure on November 3. If public demand for a good thing has value in forming the opinions of the voters the amendment should have an overpowering majority. For some weeks there has been waged in the State a cleverly planned and admirably conducted campaign for arousing interest in the measure. This campaign was directed by the Minnesota State Forestry Association. Various civic bodies lent their aid, women's clubs in every town where they are established had their members personally communicate with influential citizens and ask their support of the measure, the railroads, the telephone and telegraph companies gave their assistance, while the newspapers were particularly active in doing the invaluable publicity work needed to rivet the attention of the voters on the fact that the amendment would be upon their ballots, and what it meant to the State.

Perhaps the most effective work, however, was done by the children. The Governor proclaimed a State Forests Day for the schools and this was observed by every public school in the State. The five hundred thousand pupils addressed letters, furnished by the Minnesota Forestry Association, to their parents, asking them to vote for the amendment. At this writing there is every indication that the amendment will be carried and if it is, it will mark a big forward step in the conservation of the forests of Minnesota.

Changes of Address

Members of the American Forestry Association are requested to send notification of any change in address so that the AMERICAN FORESTRY MAGAZINE and other mail will not be delayed in reaching them.

Such notices are desired before the 25th of each month so that the address may be changed for the monthly mailing of the magazine.

FOREST NOTES

The Central West Virginia Fire Protective Association, with Merritt Wilson, President, George B. Thompson, Vice President, George W. Wilson, Secretary-Treasurer, as well as Lloyd Hansford of Parsons, H. W. Armstrong and B. L. Roberts of the Cherry River Boom and Lumber Company and Charles U. Luke and E. P. Shaffer, representing the West Virginia Pulp & Paper Company, attending, met at Elkins, West Virginia, on October 17. W. Hoyt Weber, Forester and Field Manager for the Association, and J. A. Viquesney, State Forest, Game and Fish Warden, submitted reports showing work completed and men employed. The State has constructed 13 lookout stations and 4 patrol routes, and the Government has supplied watchmen and patrolmen, under the provisions of the Weeks Law, for these lookout stations and patrol routes, numbering sixteen in all. The Association has already employed 8 patrolmen and authorized the employment of two more, making a total of ten patrolmen employed by the Association, or twenty-six salaried men in all. It is just one year since the contract was signed whereby Government aid was secured, under the Weeks Law, to protect the forests from fire, and under the triple alliance and cooperation of Government, State and private owners, it has been demonstrated that millions of dollars can be saved to the timber owners of the State. The timberland owners of the forest area of the State are greatly pleased that ways and means have been devised to save the forests from fire, and all are anxious to join this organization and have their property protected under this arrangement.

A warning against tree repair fakirs has been issued by the Massachusetts State Forestry Association to its members. It calls attention to the necessity of exercising great care in having honest and competent tree surgeons and points out the damage that may easily be done by men who are not properly trained for the work and the exorbitant prices charged by those who take advantage of the ignorance of the tree owner.

Here is an exact reproduction of an application received by District Forester Smith Riley of Denver for a position as Forest Ranger. It is worth reading:

————, Wyo.
Sept th 28—1914

"Dear Sir, I hear that you Want Forast-Rangers. and I think I Wood Souit you & the Job Wood Souit me, I have Ben in the West hear 9 years and am ust to hard-ships and like to Ride, all tho I am not no Bronko Broker. What I mean, is "if they Buck to hard they can throw me off" 'and I am all-so a good timber man as I have Ben in the timber all of my life., I have a comon School Edukation, "I am a married man With no Children Just me & Wife. My Wife has a 320 acare Home-Stead in ——— Co & has lived

on it 2 years all Reddy, 'can she go With me & still hold her Home-stead,? she has all-Reddy lived on it 23 months studdy Everry Day; and is that Forast-Ranging a souitible Place to take a Wommon.

"Do you think the Job Wood last 3 or 4 years if I souited. how much Do you Pay a month. and Do I Board my self Or Dos the Goverrement Furnish my suplys? Do I Furnish my Own hors? is there a little hosuse on "or around the Place Where I Wood make it my head-quarters.? You see I am Green at the Job now, But I think in a week after I got there I Wood no all about it, Pleas Rite and give me all of the infermation about it, there is 2 more single men hear in my Neighborhood Wood go to if they under-stood Just What kind of a Job it Was, yours sincearley"

James A. Conners, of James W. Sewall's office, Old Town, Maine, has taken a crew of men into northern Aroostook County, Maine, on a detailed township survey and timber estimate. Mr. O. W. Madden, of the same office, is cutting about a million feet of lumber for Mr. Sewall on the Passadumkeag River watershed.

Exception is taken by Bristow Adams, editor of the *Forest Service*, to a statement in the *American Lumberman* for September 19 that a disease which has attacked trees in Michigan is thought to have gotten into Michigan through seedlings sent by the National Government. Mr. Adams said this statement is not warranted by the facts in the case.

"Diseased specimens of western yellow pine," he says, "were submitted last spring for examination by the Office of Investigations in Forest Pathology in the Bureau of Plant Industry. The trees were said to have been grown at the Higgins Lake Nursery from seed obtained from the West and were found to be affected with the fungus disease *Cronartium comptoniae*. This is a well known eastern fungus which passes one of its stages on the sweet fern. In its stage on the pine it has also been known as *Peridermium pyriforme*. It seems evident, therefore, that the western yellow pine trees in question became infected from sweet fern in the neighborhood, and, never having been exposed to the disease, might readily prove more susceptible to it than the native species. The disease is referred to in the item in the *American Lumberman* as "*Peridermium fusiform*," a quite distinct disease which was not found by the Office of Forest Pathology in its examination. Even if this disease is present among the yellow pine, however, it could hardly have been introduced by the Government, since, so far as the records in this office show, no trees have ever been furnished to the State by the Forest Service and the disease is not one which could be transmitted through the medium of seed.

The annual meeting of the Western Forestry and Conservation Association, the established conference of all Pacific Coast protective organizations and the most important yearly gathering of timber owners in the United States or Canada, will be held in Tacoma this year, December 7 and 8. The fire protection part of the program will abandon the general topics so thoroughly covered in the past and deal only with important needs disclosed by the past season; the chief of which seem to be a better system for financing emergency expenses, perfecting state policies and legislation, requirements for continuation of Weeks Law funds, and utilizing fire wind forecasts in the most practicable manner. A study of timber insurance possibilities will be reported. While what is really new and important in fire work must not be neglected, it has been decided that at this time such an important gathering should devote much of its time to other matters of pressing interest. With the proper officials present to give us authentic information, there will be discussion of the new Government study of the lumber industry, the Trades Commission bill, Forester Graves' new plan for capitalizing national forest resources to assist state road building, and taxation amend-

ments now up in Pacific states. The stumpage situation and its trend is another subject chosen for expert analysis.

Foresters will be interested in the announcement that Charles Deering of Chicago and W. A. Wadsworth of Genesco, N. Y., members of the American Genetic Association, have offered two prizes of $100 each for two photographs—one of the largest tree of a nut-bearing variety in the United States, and one of the largest broad-leaf tree which does not bear edible seeds. In the first class, for example, are included trees such as chestnut, oak, walnut, butternut, and pecan; and in the second, trees such as elm, birch, maple, cottonwood, and tulip poplar. No photographs of cone-bearing trees are wanted, since it is definitely known that the California big trees have no rivals among conifers. At a later time the association may take up the same question as between the various kinds of conifers—as pines, spruces, firs, cedars, and cypresses.

The purpose of the competition is to find out in what regions the native trees attain their largest growth, and under what conditions they thrive best. When these large trees are located and the measurements authenticated, the association hopes that it may be possible to secure seeds, cuttings, or grafting wood from thrifty trees in the region where they grow, to see whether finer specimens may be propagated in other parts of the country. It is hoped in this manner to get some particularly choice strains of native trees established in regions where good specimens are not now found. The contest ends July 1, 1915.

Prof. James B. Berry has been placed in charge of the Department of Forestry of the State College of Agriculture at Athens, Ga., and the Board of Trustees on October 13 changed the name of the department to the Georgia State Forest School. In this way the school has all the privileges of an independent institution and yet retains all the advantages connected with the instruction work in the University proper and the Agricultural College. It thus becomes the only forestry school in the south. The school is now being thoroughly equipped and Prof. Berry expects to secure a large number of students.

Prof. Berry is a graduate of the College of Forestry, University of Minnesota; spent fifteen months in the Forest Service as Forest Assistant on the Inyo National Forest of California; was for two years instructor in forestry at the Pennsylvania State College where he was granted the degree of Master of Science as a result of special investigative work in range problems. He spent fourteen months in Germany and Austria-Hungary, completing one year's work in the Universitat München where he was a Candidate Doctor der Staatswissenschaft.

The Georgia State Forest School will offer a regular four year course in forestry leading to the degree Bachelor of Forestry. A small amount of forestry will be introduced in the Freshman and Sophomore years, but the bulk of the work will come later. Following the Junior year is a summer camp of eight weeks which will be largely devoted to surveying, mensuration, forest botany and forest ecology.

The Massachusetts State Forestry Association has announced another annual tree planting contest, following the successful one of this year, and as a prize will plant in each of the four winning towns one hundred shade trees. The towns are divided into four groups, according to size, and to be eligible for a prize a town must plant at least one hundred trees. Those planting the most and having the largest number of living trees on Sept, 15, 1915, will be awarded the prizes. The trees counted must be eight feet or over in height and the branches should be properly pruned at the time of the planting. For full particulars write the Association at 4 Joy Street, Boston, Mass.

BOOKS RECEIVED

THE FIRST EXPOSITION OF CONSERVATION AND ITS BUILDERS (W. M. Goodman, Knoxville, Tenn., $10.00).

Here artistically bound, well illustrated and admirably printed, is a large volume devoted to the history of the National Conservation Exposition at Knoxville in 1913, of the movement which started it and of the men and women who were its builders and to whom such a large measure of its success was due. There is an introduction by Gifford Pinchot and then a very well written and complete history of the Exposition with a series of special chapters devoted to each of the several buildings and their exhibits. Great care has been taken to give each of the people deserving mention for aid in the work of organizing and conducting the Exposition the proper credit. A special feature are the papers on various phases of conservation work written by men and women who are recognized as experts and there are also extracts from addresses by prominent speakers on special days at the Exposition. It is a book which will be appreciated and valued by any person having part in the Exposition, for not only is it brim full of information, but it is mechanically a production which will attract most favorable comment.

"ELEMENTS OF FORESTRY" by Frederick Franklin Moon, B. A., M. F. and Nelson Courtlandt Brown, B. A., M. F. (John Wiley & Sons, New York, $2.00 net.)

This is an up-to-date text book, broad in its scope and containing general information on all phases of forestry. The authors have made an earnest endeavor to present the instruction in a manner easily grasped by the average student. The subject is treated under the chapter headings of trees, silvics, silvicultural systems and management, improvement cuttings, artificial regeneration, forest protection, forest mensuration, lumbering, wood utilization, wood technology, wood preservation, forest economics, forest finance, forest regions, northern forest, sprout hardwoods, southern pines, central hardwoods, prairie or fringe forests, northern Rocky Mountain forest, southern Rocky Mountain forest, and Pacific Coast forest. The book is profusely illustrated. There are 300 pages.

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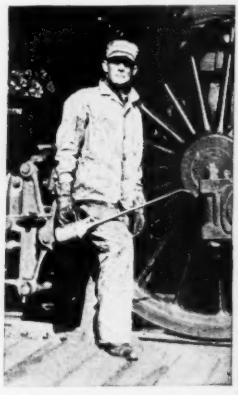

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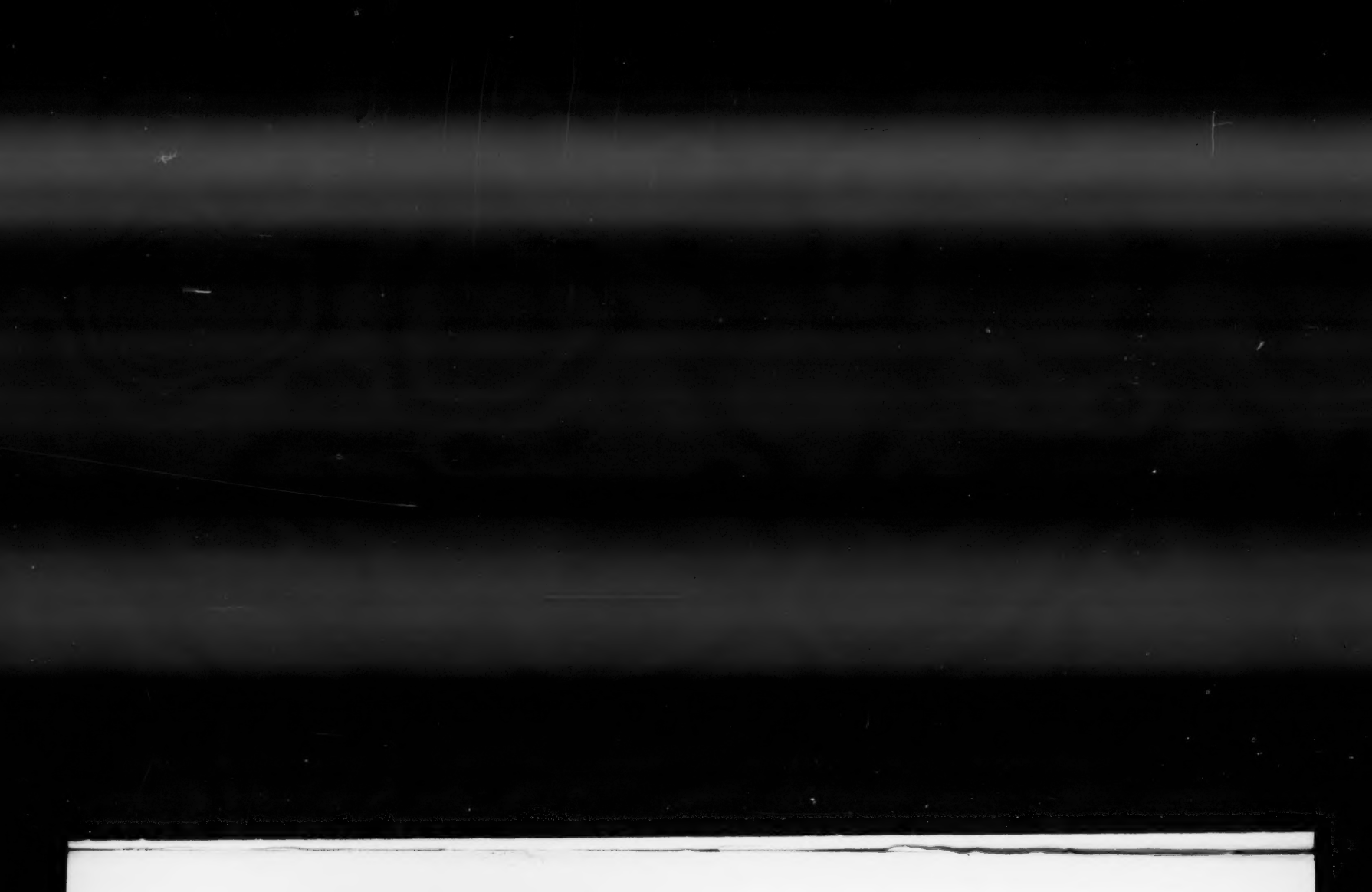
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